



PLS 503 Plant Nutrition

COURSE SYLLABUS: SPRING 2025

INSTRUCTOR INFORMATION

Instructor:

Dr. Desire Djidonou, (Dr. D), Assistant Professor – Urban/Sustainable Horticulture

Office Location: Ag/ET 248

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Preferred Form of Communication: email

COURSE INFORMATION

Materials – Textbooks, Readings, Supplementary Readings

There is no required textbook for this course. Digital copies of selected chapters from the books below will be provided via D2L to complement lecture slides.

- Marschner, P. 2012. Marschner's **Mineral Nutrition of Higher Plants**. 3rd Edition. Academic Press, New York.
- Mengel, K. and Ernest A. Kirkby (eds.). 2001. **Principles of Plant Nutrition**. Fifth edition. Dordrecht: Kluwer Academic Publishers, 849 pages.
- Epstein, E. and Bloom, A.J. 2004. **Mineral Nutrition of Plants: Principles and Perspectives**. 2nd Edition. Sinauer Associates, Inc. Sunderland, MA.

Course Description

Plants require a number of specific mineral elements from the external environment for their growth and development. This course provides a thorough overview of the biophysical, biochemical, and physiological processes by which plants absorb these elements from the soil, translocate them throughout the plant, and biochemically assimilate them. 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 320 or any introductory course on Soil Fertility and Plant Nutrition

The syllabus/schedule are subject to change.

Student Learning Outcomes

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

1. Describe plant nutrient uptake mechanisms, transport, and assimilation;
2. Describe the essential plant nutrients in relation to their functions, deficiency and toxicity symptoms;
3. Evaluate the effect of soil physical and chemical properties on nutrient availability;
4. Develop practical skills necessary to successfully estimate crop nutrient input requirements and apply a nutrient management program for a number of cropping systems.
5. Develop writing skills through critical review and summary of scientific literature pertaining to plant nutrition and soil fertility.

COURSE REQUIREMENTS

Minimal Technical Skills Needed

Students will need a computer with Internet access in order to access and use D2L. Basic knowledge of Microsoft office (especially Excel) is required for homework assignments.

Instructional Methods

Lectures: The entire course will be managed through e-learning using D2L, where all materials (PowerPoint lecture slides, book chapters, videos, and other learning materials) will be posted for students to download and review; and also where exams and assignments will be administered.

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 assignments and exams by the due dates;
3. Late submission of assignments or make-up of 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 600 points total from exams, quizzes and assignments.

Items	Points
Exam 1	100
Exam 2	100
Cumulative final exam	150
Assignments	100
Literature review	50
Special project – Fertilization plan	100

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Exams: There will be two non-cumulative exams and one final cumulative exam taken through D2L. The exams will include material from lectures, additional reading assignments, and handout and consist of short answer/essay, multiple choice, and T/F questions.

Homework assignments: There will be 4 to 5 homework assignments posted on D2L with due date.

Literature review: There will be two published articles related to topics in plant nutrition to review and summarize in a review report.

Special project: Students will develop a fertilization management plan for a selected crop based on soil analysis result.

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>

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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

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](#).

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<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

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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/>

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 East A&M campuses. Report violations to the University Police Department at 903-886-5868 or 9-1-1.

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COURSE OUTLINE / CALENDAR

Lecture Schedule

Week	Dates	Topics, Exam	Reading
1	Jan 13 – 17	Lecture 0: Welcome – syllabus overview	
2	Jan 20 – 24	Lecture 1: Basic of Plant Nutrition	Chap 1 (Marschner)
3	Jan 27 – 31	Lecture 2: Soil nutrient bioavailability – Nutrient movement in soils	Chap 12 Chap 14 and 15
4	Feb 03 – 07	Lecture 3: Nutrient Uptake at the Root Surface – Short Distance Transport	Chap. 2
		Lecture 4: Water relations and long-distance transport in the xylem and phloem	Chap 3
		Exam 1	-
5	Feb 10 – 14	Lecture 5: Nitrogen – Cycling, uptake, assimilation, function, and deficiency	Chap 6
6	Feb 17 – 21	Lecture 6: Phosphorus – Cycling, uptake, assimilation, function, and deficiency	Chap 6
7	Feb 24 – 28	Lecture 7: Potassium – Cycling, uptake, assimilation, function, and deficiency	Chap 6
8	Mar 03 – 07	Lecture 8: Basics of Fertilizer Calculation for Field Production	Handout
9	Mar 10 – 14	Spring Break	
10	Mar 17 – 21	Lecture 9: Calcium, Magnesium, and Sulfur	Chap 6
11	Mar 24 – 28	Exam 2	
12	Mar 31 – Apr 04	Lecture 10: Micronutrients: Iron, Manganese, Zinc, Molybdenum, Boron, Copper, Chlorine	Chap 7
13	Apr 07 – 11	Lecture 11: Beneficial nutrients – Sodium, Silicon, and Cobalt	Chap 8
14	Apr 14 – 18	Lecture 12: Managing soil acidity and alkalinity	-
15	Apr 21 – 25	Lecture 13: Soil fertility evaluation	
16	Apr 28 – May 02	Lecture 14: Nutrient management, Agricultural productivity, and environmental quality	
17	May 05 – 09	Final exam and special project due	

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