PLS 501 Plant Science Instrumentation
Course Syllabus: Fall 2024

Instructor: Derald Harp, Ph.D., Professor - Horticulture
Office Location: AgIT 155, PSC 103
Office Hours: @PSC 103 MW 10 – 11 am, M 3 – 4 pm
@AgIT 155 MW 8 – 9 am, TR 11 am - Noon
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I. Course Description
Principles, equipment, and techniques for measuring variables in plant, soil, and environmental sciences. Weather sensors, instrumentation for plant physiological measures and soil properties, and common laboratory equipment will be discussed. 3 hours (2/2).

II. Prerequisites None

III. Student Learning Outcomes

A. Students will be able to collect data on environmental variables, plant physiologic responses, and soil properties

B. Students will analyze the data and make conclusions about plant responses to environmental conditions

C. Students will learn how to perform basic and necessary maintenance on laboratory equipment.

IV. Expectations of the Students

A. Regular attendance in lecture and lab

B. Evidence of accumulated knowledge

C. Active participation in laboratory exercises.

V. Textbook

None

VI. Course Information

Course Outline

Week 1	Introduction Safety Environmental Measures Weather stations
Week 2	MS Excel and Pivot Tables *Climograph exercise*
Week 3	LI-COR LI-3100C Leaf Area Meter Digital balances Drying oven *Quantifying biomass and leaf size*
Week 4	pH / Electrical Conductivity *Soil pH techniques* *Fertilizer confirmation*
Week 5	Quantum Light Sensors Infrared Thermometers *Measuring soil and leaf temperatures*
Week 6	Soil Tensiometers Time Domain Reflectometry *Quantifying and measuring soil moisture*
Week 7	Plant Pressure Chamber *Quantifying and measuring plant water content and tension*
Week 8	SPAD / Chlorophyll extraction Spectrophotometer / Plate Reader *Leaf chlorophyll content*
Week 9	LI-COR LI600 Fluorometer and Porometer *Calibration and Survey Measurements*
Week 10	LI-6800 Photosynthesis Measurements *Light Saturation Point*

Week 11 LI-6800 Light Response Curve

Week 12 LI-COR 6400XT soil CO_2 efflux
Organic matter conversion and soil respiration

Week 13 Data collection

Week 14 **Thanksgiving Holiday, November 28 and 29, 2024**

Week 15 Research presentation

Course Grading

A. 10 Weekly Research Reports - 500
B. Major Research Presentation - 200 points
C. Grading Scale
    630+ = A
    560-629 = B
    490-559 = C
    420-489 = D
    <420 = F

TECHNOLOGY REQUIREMENTS

LMS

All course sections offered by Texas A&M University-Commerce 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

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

ATTENDANCE

Weekly participation for PLS 501 is highly encouraged. The student should use his/her best discretion and decisions about their personal health as to whether or not to attend class and lab face-to-face. If the student is unable to attend in person, videos will be available that provide necessary instruction to use the equipment for the week's project. The student should schedule with

COURSE AND UNIVERSITY PROCEDURES/POLICIES

Course Specific Procedures:

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. Students are expected to respect the rights of others in the class. Cell phones and other electronic equipment should be turned off prior to the beginning of class. Use of these items during class time, or any other unwarranted classroom disruption, will result in your immediate excusal from class for the remainder of the period.

You may bring drinks to class. Please finish any meals before class begins. The use of tobacco products during class time is strictly prohibited.

Cheating of any kind will not be tolerated. Copying of others' work, use of disallowed material on exams, plagiarism in assignments, or cheating in any other form as defined

by the instructor will result in a grade of zero for that assignment. Multiple infractions will result in a grade of 'F' for the course. No electronic equipment, except calculators, will be allowed during exams. Violation of this will result in an immediate grade of '0' for the exam.

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

Academic Integrity

Students at Texas A&M University-Commerce 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

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
Texas A&M University-Commerce
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

Texas A&M University-Commerce 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 Carry"

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 ((http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf) and/or consult your event organizer). 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.