

PLP 6105: APPLIED PLANT DISEASE MANAGEMENT

3 CREDITS (GRADED), SUMMER C 2022, ONLINE (SEMI-SYNCHRONOUS)

"Crop loss studies are an end point of epidemiology; here this science comes to new crossroads, first with crop physiology and second with economics and sociology." *Jan C. Zadocks and Richard Schein. 1979. Epidemiology and Plant Disease Management. Oxford University Press, Inc., p. 237.*

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OFFICE HOURS: Office hours are Monday-Friday 9-4 by appointment only; appointments must be requested by email (nsdufault@ufl.edu) at least 48 hours in advance. Office hours may take place at 1441 Fifield Hall, by phone, or virtually via Teams or Zoom. Course-related communications will be addressed once per weekday (M-F), between 9 am and 4 pm eastern.

COURSE WEBSITE: <http://elearning.ufl.edu/>

COURSE COMMUNICATIONS: Questions and discussion are encouraged; most questions should be raised on the class discussion board when relevant to allow for group comment and learning. Private questions should be sent to the instructor at nsdufault@ufl.edu.

REQUIRED TEXT: There are no required texts but there will be assigned readings. Assigned readings will be provided via the course website.

ADDITIONAL RESOURCES: Recommended texts: A Practical Guide to Turfgrass Fungicides by R. Latin; Fungicides for Field Crops, Eds. Mueller et al.; Current Vegetable Production Handbook for Florida, Eds. Dittmar et al.; Plant Pathology, Agrios et al, 5th edition or later; Essential Plant Pathology, Schumann and D'Arcy, 2nd Edition; Epidemiology and Plant Disease Management, Zadoks and Schein; Principles of Plant Disease Management, W. Fry.

COURSE DESCRIPTION: The goal of plant disease management is to reduce the economic and aesthetic damage caused by plant diseases. This course summarizes the methods and strategies used to manage plant diseases by targeting vulnerable points in the pathogen life cycle and epidemiology. This course is not intended as a chemical classes and modes of action primer; however, we will discuss management chemistries as a general knowledge is needed for disease management. Over the course of the semester, students utilize knowledge of

organismal biology, epidemiology, management chemistry, and economics to develop strategies for managing plant diseases.

PREREQUISITE KNOWLEDGE AND SKILLS: An introductory course in biology, plant science, or microbiology is recommended. Additionally, basic knowledge of plant horticulture will be valuable in the interpretation of management strategies, and an introductory course in plant pathology is strongly advised, but not required. Students should have a working knowledge of the distance-education tools used to disseminate the course content; at a minimum, students will need to be able to navigate the course website and materials, play the lectures, link to online resources, participate in chat-type discussions, use and respond to email, and produce and upload written and video content to the course website.

PURPOSE OF COURSE: The purpose of this course is to develop and/or advance students' knowledge of plant disease management options, incorporating pathogen biology, epidemiology, management chemistry, and economics.

COURSE GOALS AND/OR OBJECTIVES: By the end of this course, students will/will be able to:

- ✓ define plant disease in general terms and understand the plant disease pyramid
- ✓ define types of inoculum, examples of initial vs secondary (monocyclic vs polycyclic)
- ✓ contrast disease incidence and severity
- ✓ identify common rating scales, describe potential pitfalls of disease assessment tools
- ✓ contrast bacterial, fungal and viral disease symptoms and signs, name the diagnostic tests and efficacies, discuss potential pathogen spread, discuss cultural/environmental factors conducive to bacterial disease development
- ✓ recognize symptoms/signs of common abiotic and arthropod/other agent damage
- ✓ identify personnel who can assist with each type of plant problem
- ✓ identify how to collect a plant disease sample and interpret lab results
- ✓ explain prevention, sanitation, protection, therapy & exclusion management techniques
- ✓ understand how to find and interpret product labels and efficacy data
- ✓ identify management component costs (labor, product, community, reputation)
- ✓ define IPM, recognize the components of an integrated management plan
- ✓ calculate product application amounts, understand application equipment calibrations
- ✓ explain how to relay or provide disease management information to the public and private industry

INSTRUCTIONAL METHODS: This course is online. It is structured as a series of modules with assessments built in. I utilize graded quizzes (at the end of a lecture, meant to direct students' attention to important topics and to give me an idea of areas that may need more instruction) and graded projects and papers (at the end of a unit, to assess students' retention and comprehension of important topics). I also assign papers to read for additional information,

projects to complete to demonstrate problem-solving, and discussion boards to gauge participation. This course is taught at the graduate level.

COURSE POLICIES:

ATTENDANCE POLICY: Your registration in this course indicates your willingness to participate fully. As this is an online course, you may progress through the modules at your own pace, within the weeklong time frame of the assigned modules. Participation is gauged during timed discussion boards (which count as part of the overall grade), but there are no other required attendance opportunities. Withdrawal from this course must be during the normal add/drop window designated by UF.

QUIZ/EXAM POLICY: Quizzes and projects are intended to provide the student with opportunities to apply what they learn. Grades will be based on timed open-book quizzes, projects, participation in discussion threads, and the final timed, open-book exam. The final exam is cumulative and occurs the last week of classes. I will drop your lowest quiz grade when calculating your overall grade. You may inquire about quiz and exam grades for 48 hours following the return of grades for that quiz or exam; feedback should be pertinent to the learning objectives at that time.

MAKE-UP POLICY: Quizzes and projects have a window in which they must be completed. Emergencies do happen, and if they will impact your participation in any graded opportunity, you must contact the instructor by email as close as possible to the quiz/exam/project due date and time. Make-up quizzes/exams/assignments may be allowed under such circumstances; a doctor's note or other official documentation may be required. Power outages, computer problems, and software glitches may occur, even under the best of circumstances. In order to allow yourself plenty of time to work around these unforeseen technological issues, do not wait until the last minute to complete assignments or assessments at the end of each module!

ASSIGNMENT POLICY: Assigned readings are for your edification and to expand your knowledge base. Major topics from assigned readings may be addressed in quizzes and the final exam. Assignment/quiz/exam due dates are listed on the website and times are firm; plan accordingly. Rare exceptions may be made in the event of an emergency, see the make-up policy above. Requirements for class attendance and make-up work are consistent with university policies that can be found at: <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>.

COURSE TECHNOLOGY: This course is delivered through the online resource, Canvas. The course and support and resources are all available at <http://elearning.ufl.edu/>. Registration in this course indicates you have basic knowledge in computer use and online technology to enable your full participation in the course. Since we are using an electronic resource, your

registration indicates you understand that things such as bandwidth, power, etc., are integral to making it work, and you will plan accordingly.

GRADING POLICIES:

Assignment	Percent
Quizzes/Short assignments	30%
Disease factsheet (3 assignments)	12%
Management in a jiffy	8%
Management plan project	20%
Discussion participation and grading others' assignments (peer-to-peer learning and evaluation opportunities)	15%
Final exam	15%

GRADING SCALE: This course will be graded using letter grades, to include minus grades.

Letter grade	%	Points	Assignments are weighted by the number of points assigned to them. Final grades are calculated as total points earned out of total points possible for the course assignments. Total points for the course equal 250, and the number of points needed to reach a certain letter grade or percent grade are noted in the table to the left. I round one decimal point, so an 83.5 becomes an 84, but an 84.4 becomes an 84.
A	94-100	235	
A-	90-93	225	
B+	87-89	218	
B	84-86	210	
B-	80-83	200	
C+	77-79	193	
C	74-76	185	
C-	70-73	175	
D+	67-69	168	
D	64-66	160	
D-	60-63	150	
E	<59.5	<148.75	
Total points		250	

LATE ASSIGNMENTS POLICY: Although you should make every effort to submit your assignments on time, late assignments will be given half credit (the assignment will be graded, then that grade will be divided by two for your final grade for the assignment) if turned in within two days of the due date. After that, the assignment grade will be a zero. Please plan accordingly; each assignment is open for a specific time period.

EXTRA CREDIT: Development of a short video or automated PowerPoint presentation on a specific topic related to disease management will be considered for one extra credit project. The objective of the project will be to enrich the course material with an explanation of a specific concept (e.g., how to calculate a sprayer or how a specific host-pathogen system is detected, diagnosed, or managed). The project must be outlined and proposed to the instructor, approved by the instructor, and the final product submitted before the last week of

the course. Projects will be worth up to five points, and the points awarded for the project will be added to the final points earned.

Course Schedule:

This course will be taught as a series of modules during a 13-week session (summer C). You will need to complete the assessment(s) within each module before you can open a new module. Modules will open each Monday at 12:01 am. The final exam will be open for a specific 1.5-hour window of time on the exam day; you may start the exam at any point during the day between 7 am and 7 pm, and the clock will count down for 90 minutes. The exam will close at 7 pm, regardless of when you start the exam (so start no later than 5:30 pm). These timelines will be detailed during the first lecture.

Topic	Description	Assignment/ Assessment
Week 1:		
Course overview	Inspect syllabus, grading policy, expectations, how to get help, accommodations responsibilities; explanation of concepts flow	Quiz
Intro to Plant Disease Management 1	What is a plant disease, disease pyramid, pathogen life cycles and management; Management vs control; Typology of loss; Yield loss	
Week 2:		
Intro to Plant Disease Management 2	Organic and conventional production systems; Integrated pest management (IPM)/ Integrated Disease Management (IDM); Sanitation and Cultural Methods	Quiz
Week 3:		
Disease diagnosis	Importance of diagnosis; Appropriate sample; Diagnosis process and interpretation	Quiz; Factsheet-1 Draft
Week 4:		
Viral disease detection and diagnosis	Symptoms, signs, diagnostic tests, cultural/environmental factors, potential means of spread	Quiz; Factsheet-1 Final
Bacterial disease detection and diagnosis	Symptoms, signs, diagnostic tests, cultural/environmental factors, potential means of spread	Quiz

Fungal disease detection and diagnosis	Symptoms, signs, diagnostic tests, cultural/environmental factors, potential means of spread	Quiz
Week 5:		
Confounding factors	Abiotic issues, nematodes, insects; vectors; asymptomatic hosts	Quiz; Factsheet-2 Draft
Plan of attack	What data to collect; scouting, sample collection; diagnosis; interpreting results	
Week 6:		
Disease assessment	Incidence and severity; Disease assessment and rating (visual aids, scales and drones)	Factsheet-2 Final
Week 7:		
Epidemiology I	Disease cycle review, disease progress curve; inoculum; monocyclic vs. polycyclic diseases	Quiz; Factsheet-3 Draft
Epidemiology II	Management effects on disease progress curves; Spread local and regional	Quiz
Week 8:		
Viral, bacterial and fungal disease management	Management options (resistance, chemical, cultural, biological)	Quiz; Factsheet-3 Final
Week 9:		
Pesticide labels	Reading a pesticide label, emergency exemptions, finding products, efficacy trials	Quiz; Management in a Jiffy: Podcast
Pesticide usage	Safety; application methods; calibration; Residential vs. Commercial sprayers; managing drift	Quiz
Week 10:		
Fungicides 101	Modes of action, mobility, resistance management (FRAC and relationships to IRAC and HRAC)	Quiz; Case study Assignment
Week 11:		
Management Recommendations	Data analysis and interpretation; Taking action	Develop Management Plan
Disease forecasting	Forecasting models and decision support tools utilities and comparisons	Quiz
Week 12:		
Economics and Social Science	Thresholds, inputs, and decisions; Perception of risk	Quiz

Ethics and responsibilities	Finding balance in our responsibilities and moral positions; From plant problem to management recommendation	
Putting it all together	Final exam preparation and review	Develop and submit 5 exam questions
Week 13:		
Final exam	Cumulative exam (90 minutes, open book) Wednesday August 4 th	

Disclaimer: This syllabus represents my current plans and objectives; it is subject to change as the need arises to enhance the class learning opportunities. Such changes, communicated clearly, are not unusual and should be expected.

UF POLICIES:

UNIVERSITY POLICY ON ACCOMMODATING STUDENTS WITH DISABILITIES: Students requesting accommodation for disabilities must first register with the Dean of Students Office (<http://www.dso.ufl.edu/drc/>). The Dean of Students Office will provide documentation to the student who must then provide this documentation to the instructor when requesting accommodation. You must submit this documentation prior to submitting assignments or taking the quizzes or exams.

UNIVERSITY POLICY ON ACADEMIC MISCONDUCT: As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: *“On my honor, I have neither given nor received unauthorized aid in doing this assignment.”* It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g., assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: <https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>

SOFTWARE USE: All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

NETIQUETTE: COMMUNICATION COURTESY: All members of the class are expected to follow rules of common courtesy in all email messages, threaded discussions, and chats. [Describe what is expected and what will occur as a result of improper behavior] <http://teach.ufl.edu/wp-content/uploads/2012/08/NetiquetteGuideforOnlineCourses.pdf>

ONLINE COURSE EVALUATION PROCESS: Student assessment of instruction is an important part of efforts to improve teaching and learning. At the end of the semester, students are

expected to provide feedback on the quality of instruction in this course using a standard set of university and college criteria. These evaluations are conducted online at <https://gatorevals.aa.ufl.edu/>. Evaluations are typically open for students to complete during the last two or three weeks of the semester; students will be notified of the specific times when they are open. Summary results of these assessments are available to students at <https://gatorevals.aa.ufl.edu/>.

STUDENT PRIVACY: There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: <http://registrar.ufl.edu/catalog0910/policies/regulationferpa.html>

GETTING HELP:

For issues with technical difficulties for E-learning in Canvas, please contact the UF Help Desk at:

- helpdesk@ufl.edu
- (352) 392-HELP - select option 2
- <http://helpdesk.ufl.edu/e-learning-support/>

** Any requests for make-ups due to technical issues MUST be accompanied by the ticket number received from LSS when the problem was reported to them. The ticket number will document the time and date of the problem. You MUST e-mail your instructor within 24 hours of the technical difficulty if you wish to request a make-up.

Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

- University Counseling & Wellness Center, 3190 Radio Road, 352-392-1575, www.counseling.ufl.edu/cwc/
 - Counseling Services
 - Groups and Workshops
 - Outreach and Consultation
 - Self-Help Library
 - Wellness Coaching

- U Matter We Care, www.umatter.ufl.edu/
- Career Resource Center, First Floor JWRU, 392-1601, www.crc.ufl.edu/

Should you have any complaints with your experience in this course please visit https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf to review the policy.

Each online distance learning program has a process for, and will make every attempt to resolve, student complaints within its academic and administrative departments at the program level. See <http://www.distance.ufl.edu/student-complaint-process> for more details.