

PLP 6105: APPLIED PLANT DISEASE MANAGEMENT

3 CREDITS (GRADED), SUMMER C 2025, 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.*

INSTRUCTOR: Nicholas S. Dufault, PhD
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OFFICE HOURS: Office hours are Monday-Thursday 9 am to 4 pm 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 standard time.

TEACHING ASSISTANT(S): Michael Goodnight (mgoodnight1@ufl.edu)

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. Dufault 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 needed for

disease management. Over the course of the semester, students will 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 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 and contextualize** plant disease concepts, including the disease pyramid and types of inoculum, in relation to plant health and management outcomes.
- **Diagnose** plant health issues by distinguishing between biotic and abiotic causes using observational data, diagnostic tools, and lab reports.
- **Evaluate** disease rating scales and assessment tools, recognizing their limitations and potential for bias in real-world scenarios.
- **Interpret and apply** diagnostic results to recommend targeted management strategies for bacterial, fungal, viral, and abiotic disorders.
- **Design integrated disease management plans** that incorporate cultural, biological, chemical, and regulatory approaches tailored to specific pathosystems.
- **Calculate and justify** product usage rates, application costs, and calibration methods within the context of field-based recommendations.
- **Critically assess** product labels and efficacy data to inform safe and legal pesticide use under varying production systems.
- **Develop and communicate** evidence-based disease management recommendations through formats appropriate for public and industry stakeholders (e.g., factsheets, podcasts, decision tools).
- **Collaborate and provide feedback** through peer review and discussion-based platforms to strengthen analytical and communication skills.
- **Reflect on ethical, social, and economic implications** of disease management decisions, including stakeholder engagement and risk perception.

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 course registration 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. 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	20%
MyIPM Disease Factsheets (3 assignments)	15%
Management in a jiffy	8%
Management plan project	20%
Discussion participation and grading others' assignments (peer-to-peer learning and evaluation opportunities)	22%
Final exam	15%

Letter	%	Points	Letter	%	Points
A	94-100	235	C+	77-79	193
A-	90-93	225	C	74-76	185
B+	87-89	218	C-	70-73	175
B	84-86	210	D+	67-69	168
B-	80-83	200	D	64-66	160
			D-	60-63	150
			E	<59.5	<148.5
Total Points: 250					

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

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 zero. Each assignment is open for a specific period, so please plan accordingly.

EXTRA CREDIT: Students can earn extra credit by developing a short video or automated PowerPoint presentation focused on a topic relevant to disease management. The objective of this project is to enhance the course material by providing an in-depth explanation of a specific

concept, such as the process of calculating a sprayer or the detection, diagnosis, or management of a particular host-pathogen system.

To participate, students must first outline and propose their project to the instructor for approval. The final product must be submitted before the last week of the course. Extra credit projects are valued at up to five points, which will be added to the final points earned in the course.

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 8 pm. Once you start the exam, you will have 1.5 hours to complete. The exam will close at 8 pm, regardless of when you start the exam (so start no later than 6:00 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	Discussion
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, Perusal
Week 3:		
Disease diagnosis	Importance of diagnosis; Appropriate sample; Diagnosis process and interpretation	Quiz, Discussion, MyIPM-Viral Draft
Week 4:		
Viral disease detection and diagnosis	Symptoms, signs, diagnostic tests, cultural/environmental factors, potential means of spread	Quiz, MyIPM-Viral 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, MyIPM-Bacterial Draft
Plan of attack	What data to collect; scouting, sample collection; diagnosis; interpreting results	Perusall
Week 6:		
Disease assessment	Incidence and severity; Disease assessment and rating (visual aids, scales and drones)	Disease Rating/Accuracy MyIPM-Bacterial Final
Week 7: Field Trip PSREU (July 1st)		
Epidemiology I	Disease cycle review, disease progress curve; inoculum; monocyclic vs. polycyclic diseases	Quiz, MyIPM-Fungal Draft
Epidemiology II	Management effects on disease progress curves; Spread local and regional	Quiz, Social Media
Week 8:		
Viral, bacterial, and fungal disease management	Management options (resistance, chemical, cultural, biological)	Quiz, Perusall, MyIPM-Fungal 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
Fungicides 101	Modes of action, mobility, resistance management: Fungicide Resistance Action Committee (FRAC)	Quiz
Week 10:		
Management Recommendations	Data analysis and interpretation; Taking action	Management Plan Draft and Review
Disease forecasting	Forecasting models and decision support tools utilities and comparisons	Quiz, Perusall
Week 11:		

Economics and Social Science	Thresholds, inputs, and decisions; Perception of risk	Quiz, Final Management Plan
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 12:		
Final exam	Cumulative exam (90 minutes, open book); Wednesday August 7 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://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-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.
https://www.cise.ufl.edu/wp-content/uploads/2019/08/CISE_Netiquette_Guide.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: <https://registrar.ufl.edu/ferpa/>

GETTING HELP:

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

- learning-support@ufl.edu
- (352) 392-4357
- <https://elearning.ufl.edu/student-help/>

****** 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, umatter@ufl.edu, <https://umatter.ufl.edu>
- Career Resource Center, First Floor JWRU, 392-1601, <https://career.ufl.edu/>

Should you have any complaints with your experience in this course please visit <https://policy.ufl.edu/regulation/4-012/> 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.