

Cover Sheet: Request 10580

PLP4XXX Applied Plant Disease Management

Info

Process	Course New Ugrad/Pro
Status	Pending
Submitter	Harmon, Carrie Lapaire clharmon@ufl.edu
Created	12/1/2015 4:47:19 PM
Updated	2/8/2016 12:07:02 PM
Description	This course has been taught under special topics prefix and number since Summer B 2015, we would like to formally begin the process to request a real course number

Actions

Step	Status	Group	User	Comment	Updated
Department	Approved	CALS - Plant Pathology 514919000	Loria, Rosemary		12/2/2015
Added Memo from Undergraduate and Graduate Coordinator for Applied Disease Management.pdf					12/1/2015
College	Approved	CALS - College of Agricultural and Life Sciences	Brendemuhl, Joel H	Requested revisions by the CALS CC have been made and the proposal is now approved.	1/21/2016
Replaced Syllabus_Applied Disease Management 4XXX 11-20-15.docx					12/3/2015
Replaced Syllabus_Applied Disease Management 6XXX 11-20-15.docx					12/3/2015
Replaced Syllabus_Applied Disease Management 4XXX 12-3-15.docx					1/5/2016
Replaced Syllabus_Applied Disease Management 6XXX 12-3-15.docx					1/5/2016
University Curriculum Committee	Comment	PV - University Curriculum Committee (UCC)	Case, Brandon	Added to the February agenda	1/22/2016
No document changes					
University Curriculum Committee	Pending	PV - University Curriculum Committee (UCC)			1/22/2016
No document changes					
Statewide Course Numbering System					
No document changes					
Office of the Registrar					
No document changes					
Student Academic Support System					
No document changes					
Catalog					
No document changes					
College Notified					
No document changes					

Course|New for request 10580

Info

Request: PLP4XXX Applied Plant Disease Management

Submitter: Harmon, Carrie Lapaire clharmon@ufl.edu

Created: 2/16/2016 9:04:08 AM

Form version: 5

Responses

Recommended Prefix: PLP

Course Level : 4

Number : XXX

Lab Code : None

Course Title: Applied Plant Disease Management

Transcript Title: Appl. Disease Mgmt.

Effective Term : Summer

Effective Year: 2016

Rotating Topic?: No

Amount of Credit: 3

Repeatable Credit?: No

S/U Only?: No

Contact Type : Regularly Scheduled

Degree Type: Baccalaureate

Weekly Contact Hours : 0

Category of Instruction : Joint (Ugrad/Grad)

Delivery Method(s): Online

Course Description : This course summarizes the methods and strategies used to manage plant disease by targeting vulnerable points in the pathogen life cycle and disease epidemic. Students utilize knowledge of organismal biology, epidemiology, management chemistry, and economics to develop strategies for managing plant diseases.

Prerequisites : BSC 2010/L or BOT 2010C and BSC 2011/L or BOT 2011C

Co-requisites : None

Rationale and Placement in Curriculum : Applied Plant Disease Management was developed to encourage integrated thinking about plant diseases, specifically how our methods of management affect the disease cycle and disease progress curves. The course was imagined to fit between Theory of Disease Control, which concentrates on specific modes of action and chemistries, and Plant Epidemiology, which focuses on advanced principles of disease modeling. To encourage all those with an interest to participate this course does not have prerequisites and augments beginner plant pathology coursework with a review of organismal and epidemiological topics. Additionally, the course is completely online, encouraging participation of place bound students and our own students studying off campus at the RECs.

Course Objectives : By the end of this course, students will/will be able to:

? define plant disease in general terms; label and define the importance of the four components of the disease pyramid; contrast management vs. control; define IPM

? define types of inoculum, examples of initial vs continuous (monocyclic vs polycyclic), contrast incidence and severity

? identify common rating scales, define potential pitfalls of disease assessment tools

? contrast bacterial disease symptoms and signs, name the diagnostic tests and expected results, discuss potential pathogen spread, discuss cultural/environmental factors conducive to bacterial disease development

? contrast viral disease symptoms and signs, name the diagnostic tests and expected results, vectors, identify vectors/means of spread, discuss cultural/environmental factors conducive to viral disease development

- ? contrast fungal symptoms and signs, name the diagnostic tests and expected results, discuss cultural/environmental factors conducive to fungal disease development, and define means of pathogen movement/spread
- ? recognize symptoms/signs of common abiotic and arthropod/other agent damage, identify the lab/agent who can identify each type of plant problem
- ? identify the information needed and samples required for submission to a lab, interpret lab results
- ? identify types of host resistance
- ? identify types of chemical resistance
- ? explain sanitation in a greenhouse, field, nursery setting; describe general and pathogen-specific cultural management tools
- ? understand how to find and interpret product labels; review of chemistries;
- ? understand how to find and interpret efficacy data
- ? identify potential biological management methods
- ? identify management component costs (labor, product, plant product quality/loss costs/benefits)
- ? define IPM, recognize the components of an integrated management plan
- ? calculate product application amounts, understand important points in sprayer calibration

Course Textbook(s) and/or Other Assigned Reading: There are no required texts. Assigned readings will be provided via the course website.

Assigned Readings

- Ade, J. and R.W. Innes. 2007. Resistance to Bacterial Pathogens in Plants. In eLS. Chichester: John Wiley & Sons Ltd. <http://www.els.net> DOI: 10.1002/9780470015902.a0020091
- Allen, T.W., A. Martinez, and L.L. Burpee. 2004. Pythium blight of turfgrass. The Plant Health Instructor. DOI:10.1094/PHI-I-2004-0929-01.
- Antignus, Y. 2001. Manipulation of wavelength-dependent behavior of insects: An IPM tool to impede insects and restrict epidemics of insect-borne viruses. *Virus Res.* 71:213-220.
- Broschat, T.K. 2008. Nutrient Deficiency Symptoms of Woody Ornamental Plants in South Florida. IFAS Extension Publication ENH1098.
- Carlson, G.A. and C.E. Main. 1976. Economics of disease-loss management. *Annu. Rev. Phytopathol.* 14:381-403.
- Common and Trade Names of Fungicides. Ct.gov
- Cultural practices for reducing crop diseases. Texas Plant Disease Handbook. Texas A&M AgriLife Extension. <http://plantdiseasehandbook.tamu.edu/problems-treatments/methods-and-materials/cultural-practices-for-reducing-crop-diseases/>
- Elliot, M., K. Pernezny, A. Palmateer, N. Havrane. 2008. Guidelines to Identification and Management of Plant Disease Problems: Part I. Eliminating Insect Damage and Abiotic Disorders. . IFAS Extension Publication PP248/MG441 (<http://edis.ifas.ufl.edu/mg441>).
- Elliot, M., K. Pernezny, A. Palmateer, N. Havrane. 2008. Guidelines for Identification and Management of Plant Disease Problems: Part IV. Plant Health Questions to Ask the Client. IFAS Extension Publication PP 251/MG444 (<https://edis.ifas.ufl.edu/mg444>).
- Equipment (Sprayers and Dusters). Texas Plant Disease Handbook. Texas A&M AgriLife Extension. <http://plantdiseasehandbook.tamu.edu/problems-treatments/methods-and-materials/equipment-sprayers-and-dusters/>
- Finckh, M.R., A.H.C. van Bruggen, and L. Tamm (Eds.). 2015. Plant Diseases and Their Management in Organic Agriculture. St. Paul, MN: APS Press.
- Fishel, F., W. Bailey, M. Boyd, B. Johnson, M. O'Day, L. Sweets, and B. Wiebold. 2009. IPM1006: Introduction to Crop Scouting. University of Missouri Extension. <http://extension.missouri.edu/explorepdf/agguides/pests/ipm1006.pdf>
- Florida Department of Agriculture and Consumer Services Citrus Insecticide Pollinator Protection Label Language- Interpretive Guidance. 2015. http://www.freshfromflorida.com/content/download/35554/832609/Citrus_Bee_Statements.pdf

Folimonova, S.Y., A. S. Folimonova, S. Tatineni, and W.O. Dawson. 2008. Citrus tristeza virus: survival at the edge of the movement continuum. *J. Virol.* 82:6546-6556.

Fungicide Additives. Texas Plant Disease Handbook. Texas A&M AgriLife Extension. <http://plantdiseasehandbook.tamu.edu/problems-treatments/methods-and-materials/fungicide-additives/>

Gergerich, R.C. and V. V. Dolja. 2006. Introduction to Plant Viruses, the Invisible Foe. The Plant Health Instructor. DOI: 10.1094/PHI-I-2006-0414-01

Gottwald, T.R. 2010. Current epidemiological understanding of huanglongbing. *Annu. Rev. Phytopathology* 48: 119-139.

Graham, J.H., T.R. Gottwald, and R.P. Leite. 2006. Prospects for control of citrus canker with novel chemical compounds. *Proceedings of Florida State Horticultural Society* 119:82-88.

Grogan, R.G. 1981. The science and art of plant-disease diagnosis. *Annu. Rev. Phytopathol.* 19:333-351.

Gusmini, G., T.C. Wehner, and G.J. Holmes. 2002. Disease assessment scales for seedling screening and detached leaf assay for gummy stem blight in watermelon. *Cucurbit Genet. Coop. Rpt.* 25:36-40.

Jones J. B., G.E. Vallad, F.B. Iriarte, A. Obradovic, M.H. Wernsing, L.E. Jackson, et al. 2012. Considerations for using bacteriophages for plant disease control. *Bacteriophage* 2:208-214 10.4161/bact.23857

Ma, Z., D. Felts, and T.J. Michailides. 2003. Resistance to azoxystrobin in *Alternaria* isolates from pistachio in California. *Pestic. Biochem. Physiol.* 77:66-74.

Maas, J.L. and F.A. Uecker. 1984. *Botryosphaeria dothidea* cane canker of thornless blackberry. *Plant. Dis.* 68:720-726.

McManus, P. and V. Stockwell. 2000. Antibiotics for Plant Diseases Control: Silver Bullets or Rusty Sabers. APSnet Features. Online. doi: 10.1094/APSnetFeature-2000-0600

Obradovic, A., J.B. Jones, M.T. Momol, S.M. Olson, L.E. Jackson, B. Balogh, K. Guven, and F.B. Iriarte. 2005. Integration of biological control agents and systemic acquired resistance inducers against bacterial spot on tomato. *Plant Dis.* 89:712-716.

Palmateer, A., K. Pernezny, M. Elliott, and N. Havranek. 2008. Guidelines for Identification and Management of Plant Disease Problems: Part III. Managing Plant Diseases. IFAS Extension Publication PP 250 (<https://edis.ifas.ufl.edu/mg443>).

Paret, M., N. Dufault, T. Momol, J. Marois, and S. Olson. 2002. Integrated Disease Management for Vegetable Crops in Florida. IFAS Extension Publication PP-193 (<https://edis.ifas.ufl.edu/pp111>).

Pavan, W., Fraisse, C. W., and Peres, N. A. 2011. Development of a web- based disease forecasting system for strawberries. *Comput. Electron. Agric.* 75:169-175.

Pernezny, K., M. Elliott, A. Palmateer, and N. Havranek. 2011. Guidelines for identification and management of plant disease problems: Part II. Diagnosing plant diseases caused by fungi, bacteria and viruses. IFAS Extension Publication PP 249/MG442 (edis.ifas.ufl.edu/mg442).

Putnam, M.L. 1995. Evaluation of methods of plant disease diagnosis. *Crop Protection* 14:517-25.

Seebold, K. 2008. Bacterial Canker of Tomato. University of Kentucky – College of Agriculture Cooperative Extension Service. Plant Pathology Fact Sheet PPFS-VG-06 (http://www2.ca.uky.edu/agcollege/plantpathology/ext_files/PPFShtml/PPFS-VG-6.pdf).

Seem, R.C. 1984. Disease incidence and severity relationships. *Annu.Rev. Phytopathol.* 22:137-50.

Shober, A. and G. Denny. 2010. Identifying Nutrient Deficiencies in Ornamental Plants. IFAS Extension Publication SL 318 (<http://edis.ifas.ufl.edu>).

Stansly, P.A., H.A. Smith, D.R. Seal, E. McAvoy, J.E. Polston, P.R. Gilreath, and D.J. Schuster. 2007. Management of whiteflies, whitefly-vectored plant virus, and insecticide resistance for vegetable production in southern Florida. IFAS Extension Publication ENY-735 (<http://edis.ifas.ufl.edu/pdf/IN/IN69500.pdf>).

Wieczorek, P. and A. Obrepalska-Steplowska. 2014. Suppress to survive – implication of plant viruses in PTGS A. *Plant Mol. Biol. Rep.* DOI: 10.1007/s11105-014-0755-8

Weekly Schedule of Topics : Topic Description Assignment/

Assessment

Week 1: May 9 – May 15

Course overview Review of syllabus, grading policy, expectations, how to get help, review accommodations responsibilities; explanation of flow of concepts

Discussion thread

Plant Disease Boot Camp I and II What is a plant disease; disease pyramid; pathogen life cycles; management vs. control; conventional vs organic; art and science of diagnostics; importance of proper diagnosis; symptoms and signs, introduction to IPM Quiz;

Assignment: Organic vs. conventional production management Part I

Epidemiology Disease progress curve; inoculum; monocyclic vs polycyclic diseases; disease cycle weak spots; incidence and severity; spread local and regional; how does management affect the disease progress curve? Quiz

Week 2: May 16 – May 22

Disease assessment, I and II Disease assessment and rating scales

Assignments:

1. Cane canker disease;

2. Gummy stem bight rating

The label is the law, I and II

trials, emergency exemptions

Reading a pesticide label, finding products, efficacy

Assignment:

Label project

Identification and management of bacterial diseases Symptoms, signs, diagnostic tests, cultural/environmental factors, potential means of spread, management options (resistance, chemical, cultural, biological) Quiz

Week 3: May 23 – May 29

Identification and management of viral plant diseases Symptoms, signs, diagnostic tests, cultural/environmental factors, potential means of spread, management options (resistance, chemical, cultural, biological) Quiz

Identification and management of fungal diseases Symptoms, signs, diagnostic tests, cultural/environmental factors, potential means of spread, management options (resistance, chemical, cultural, biological) Quiz

Fungicides and fungicides resistance FRAC, modes of action, resistance management

Confounding factors Abiotic issues, nematodes, insects; vectors; asymptomatic hosts

Plan of attack What data to collect; scouting, sample collection; diagnosis; interpreting results Assignments:

1. Sample submission;

2. Sample diagnosis;

3. Scouting & sample collection

Week 4: May 30 – June 5

Current issues in applied disease management Interview project – interview a professional applicator, extension specialist, pesticide regulator, or industry professional (grower, or chemical company marketing or R&D rep) Assignment:

Interview and synthesis

Recordkeeping and decision support Management plan components and considerations; forecasting models Assignment:

Decision support systems

Economics of disease management Thresholds, inputs, and decisions Quiz;

Game: Economics of disease management

Week 5: June 6 – June 12

Nozzle Talk Part I Pesticide safety and application methods Quiz

Nozzle Talk Part II Calibration; Residential vs. Commercial Sprayers

Organic agriculture Serving the organic grower, from start to finish Assignment:

Organic vs. conventional production management Part II

Ethics and responsibilities Finding balance in our responsibilities and moral positions

Feeding the future & climate change

What is sustainable ag? What does climate

change have to do with this disease management? Assignment: Write a position paper for presidential candidates
Putting it all together Preparation for final exam Assignment: Develop and submit 5 exam questions
Week 6: June 13 – June 17
Final exam Cumulative and timed, June 15

Grading Scheme : 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 170, 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.

Assignment	Percentage
Quizzes/short assignments	45%
Interview assignment	15%
Discussion participation and grading others' assignments (peer-to-peer learning and evaluation opportunities)	5%
Final exam	35%

Instructor(s) : Carrie Harmon

PLP 4XXX: APPLIED PLANT DISEASE MANAGEMENT

3 CREDITS (GRADED), SUMMER A 2016, ONLINE (SEMI-SYNCHRONOUS)

"The phytopathologists are the trained plant doctors, the 'medicine men of agriculture', whose final goal is successfully to prevent or control plant or crop diseases." *F. D. Heald. 1943. Introduction to Plant Pathology. New York: McGraw-Hill Book Company, p. 1.*

INSTRUCTOR: Carrie Lapaire Harmon, PhD

Building 1291, 2570 Hull Road
clharmon@ufl.edu
352-273-4640

OFFICE HOURS: Office hours are Monday-Friday 9-4 by appointment only; appointments must be requested by email (clharmon@ufl.edu) at least 48 hours in advance. Office hours may take place at Building 1291 (the Plant Diagnostic Center), by phone, or virtually via Lync, Skype, or Zoom. Course-related communications will be addressed once per day, between 9 am and 4 pm eastern.

COURSE WEBSITE: <http://lss.at.ufl.edu>

COURSE COMMUNICATIONS: Questions and discussion are encouraged; the majority of 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 clharmon@ufl.edu.

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

ADDITIONAL RESOURCES: Recommended texts will be available for reference during office hours: A Practical Guide to Turfgrass Fungicides by R. Latin; Fungicides for Field Crops, Eds. Mueller et al.; Current Vegetable Production Handbook for Florida, Eds. Santos et al.; Plant Pathology, Agrios et al, 5th edition or later; Essential Plant Pathology, Schumann and D'Arcy, 2nd Edition.

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 disease epidemic. Although this course is not intended as a primer in chemical

classes and modes of action, we will discuss management chemistries as they apply to specific cases. 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: BSC 2010/L or BOT 2010C and BSC 2011/L or BOT 2011C, or equivalent. 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 advance students' knowledge of management options for plant diseases, incorporating pathogen biology, epidemiology, horticulture, 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; label and define the importance of the four components of the disease pyramid; contrast management vs. control; define IPM
- ✓ define types of inoculum, examples of initial vs continuous (monocyclic vs polycyclic), contrast incidence and severity
- ✓ identify common rating scales, define potential pitfalls of disease assessment tools
- ✓ contrast bacterial disease symptoms and signs, name the diagnostic tests and expected results, discuss potential pathogen spread, discuss cultural/environmental factors conducive to bacterial disease development
- ✓ contrast viral disease symptoms and signs, name the diagnostic tests and expected results, vectors, identify vectors/means of spread, discuss cultural/environmental factors conducive to viral disease development
- ✓ contrast fungal symptoms and signs, name the diagnostic tests and expected results, discuss cultural/environmental factors conducive to fungal disease development, and define means of pathogen movement/spread
- ✓ recognize symptoms/signs of common abiotic and arthropod/other agent damage, identify the lab/agent who can identify each type of plant problem
- ✓ identify the information needed and samples required for submission to a lab, interpret lab results
- ✓ identify types of host resistance
- ✓ identify types of chemical resistance
- ✓ explain sanitation in a greenhouse, field, nursery setting; describe general and pathogen-specific cultural management tools
- ✓ understand how to find and interpret product labels; review of chemistries;

- ✓ understand how to find and interpret efficacy data
- ✓ identify potential biological management methods
- ✓ identify management component costs (labor, product, plant product quality/loss costs/benefits)
- ✓ define IPM, recognize the components of an integrated management plan
- ✓ calculate product application amounts, understand important points in sprayer calibration

HOW THIS COURSE RELATES TO THE STUDENT LEARNING OUTCOMES IN THE PLANT SCIENCE

PROGRAM: After completing this course, students will be able to: 1. evaluate the abiotic and biotic factors that impact plant growth and management, as they pertain to plant disease management; 2. recommend practices that growers and managers can implement to address the plant disease components of their cropping system; and 3. analyze and apply science-based data to solve disease problems in plant production. (Plant Science SLOs 1, 2, and 3).

TEACHING PHILOSOPHY: I see opportunity in meshing my extension and research programs with my teaching duties. The courses I teach tend towards those with practical applications. Experiential learning derived from participation in extension projects imbues coursework with real-world examples. There is additional potential for extension impact within the span of the semester, as the students apply their knowledge to solving the field and laboratory problems of extension clientele.

I encourage students to set high expectations for themselves, with a safety net of being able to work through a problem with me or their fellow students. Since my courses tend towards the applied, I employ practicum-style projects and examinations so students have an opportunity to demonstrate they have accomplished the course objectives over the course of the semester. When practical, I assign group projects to encourage students to gain additional perspectives for problem-solving. My assessment methods include quizzes, short papers, projects, and presentations so students have multiple avenues for polishing their communication skills. I have found that the best way to learn something is to teach it to others, so I encourage peer-to-peer learning and rubric-based evaluation opportunities. I strive to provide prompt evaluation and return grades quickly so students can incorporate the feedback.

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 and undergraduate level. The undergraduate version places more emphasis on building a knowledge base and interviewing a professional to develop relationships with potential employers and mentors. Lectures and most quizzes are the same for both graduate and undergraduate versions of the course. There is no final project for the undergraduate section.

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 week long 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 excel. 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 <https://lss.at.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	Percentage
Quizzes/short assignments	45%
Interview assignment	15%
Discussion participation and grading others' assignments (peer-to-peer learning and evaluation opportunities)	5%
Final exam	35%

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 170, 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	159	
A-	90-93	153	
B+	87-89	148	
B	84-86	142	
B-	80-83	136	
C+	77-79	131	
C	74-76	125	
C-	70-73	119	
D+	67-69	114	
D	64-66	108	
D-	60-63	102	
E	<59.5	<101.5	
Total points		170	

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, often one week.

EXTRA CREDIT: Development of a short video or PowerPoint 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:

FINAL EXAM: June 15

This course will be taught as a series of modules. 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 9 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: May 9 – May 15		
Course overview	Review of syllabus, grading policy, expectations, how to get help, review accommodations responsibilities; explanation of flow of concepts	Discussion thread
Plant Disease Boot Camp I and II	What is a plant disease; disease pyramid; pathogen life cycles; management vs. control; conventional vs organic; art and science of diagnostics; importance of proper diagnosis; symptoms and signs, introduction to IPM	Quiz; Assignment: Organic vs. conventional production management Part I
Epidemiology	Disease progress curve; inoculum; monocyclic vs polycyclic diseases; disease cycle weak spots; incidence and severity; spread local and regional; how does management affect the disease progress curve?	Quiz
Week 2: May 16 – May 22		
Disease assessment, I and II	Disease assessment and rating scales	Assignments: 1. Cane canker disease; 2. Gummy stem bight rating
The label is the law, I and II	Reading a pesticide label, finding products, efficacy trials, emergency exemptions	Assignment: Label project

Identification and management of bacterial diseases	Symptoms, signs, diagnostic tests, cultural/environmental factors, potential means of spread, management options (resistance, chemical, cultural, biological)	Quiz
Week 3: May 23 – May 29		
Identification and management of viral plant diseases	Symptoms, signs, diagnostic tests, cultural/environmental factors, potential means of spread, management options (resistance, chemical, cultural, biological)	Quiz
Identification and management of fungal diseases	Symptoms, signs, diagnostic tests, cultural/environmental factors, potential means of spread, management options (resistance, chemical, cultural, biological)	Quiz
Fungicides and fungicides resistance	FRAC, modes of action, resistance management	
Confounding factors	Abiotic issues, nematodes, insects; vectors; asymptomatic hosts	
Plan of attack	What data to collect; scouting, sample collection; diagnosis; interpreting results	Assignments: 1. Sample submission; 2. Sample diagnosis; 3. Scouting & sample collection
Week 4: May 30 – June 5		
Current issues in applied disease management	Interview project – interview a professional applicator, extension specialist, pesticide regulator, or industry professional (grower, or chemical company marketing or R&D rep)	Assignment: Interview and synthesis
Recordkeeping and decision support	Management plan components and considerations; forecasting models	Assignment: Decision support systems
Economics of disease management	Thresholds, inputs, and decisions	Quiz; Game: Economics of disease management
Week 5: June 6 – June 12		
Nozzle Talk Part I	Pesticide safety and application methods	Quiz
Nozzle Talk Part II	Calibration; Residential vs. Commercial Sprayers	

Organic agriculture	Serving the organic grower, from start to finish	Assignment: Organic vs. conventional production management Part II
Ethics and responsibilities	Finding balance in our responsibilities and moral positions	
Feeding the future & climate change	What is sustainable ag? What does climate change have to do with this disease management?	Assignment: Write a position paper for presidential candidates
Putting it all together	Preparation for final exam	Assignment: Develop and submit 5 exam questions
Week 6: June 13 – June 17		
Final exam	Cumulative and timed, June 15	

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** 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.

Other resources are available at <http://www.distance.ufl.edu/getting-help>

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 <http://www.distance.ufl.edu/student-complaints> to submit a complaint.

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://distance.ufl.edu/student-complaints> for more details.

Assigned Readings

- Ade, J. and R.W. Innes. 2007. Resistance to Bacterial Pathogens in Plants. In eLS. Chichester: John Wiley & Sons Ltd. <http://www.els.net> DOI: 10.1002/9780470015902.a0020091
- Allen, T.W., A. Martinez, and L.L. Burpee. 2004. Pythium blight of turfgrass. The Plant Health Instructor. DOI:10.1094/PHI-I-2004-0929-01.
- Antignus, Y. 2001. Manipulation of wavelength-dependent behavior of insects: An IPM tool to impede insects and restrict epidemics of insect-borne viruses. *Virus Res.* 71:213-220.
- Broschat, T.K. 2008. Nutrient Deficiency Symptoms of Woody Ornamental Plants in South Florida. IFAS Extension Publication ENH1098.
- Carlson, G.A. and C.E. Main. 1976. Economics of disease-loss management. *Annu. Rev. Phytopathol.* 14:381-403.
- Common and Trade Names of Fungicides. Ct.gov
- Cultural practices for reducing crop diseases. Texas Plant Disease Handbook. Texas A&M AgriLife Extension. <http://plantdiseasehandbook.tamu.edu/problems-treatments/methods-and-materials/cultural-practices-for-reducing-crop-diseases/>
- Elliot, M., K. Pernezny, A. Palmateer, N. Havrane. 2008. Guidelines to Identification and Management of Plant Disease Problems: Part I. Eliminating Insect Damage and Abiotic Disorders. . IFAS Extension Publication PP248/MG441 (<http://edis.ifas.ufl.edu/mg441>).
- Elliot, M., K. Pernezny, A. Palmateer, N. Havrane. 2008. Guidelines for Identification and Management of Plant Disease Problems: Part IV. Plant Health Questions to Ask the Client. IFAS Extension Publication PP 251/MG444 (<https://edis.ifas.ufl.edu/mg444>).
- Equipment (Sprayers and Dusters). Texas Plant Disease Handbook. Texas A&M AgriLife Extension. <http://plantdiseasehandbook.tamu.edu/problems-treatments/methods-and-materials/equipment-sprayers-and-dusters/>
- Finckh, M.R., A.H.C. van Bruggen, and L. Tamm (Eds.). 2015. Plant Diseases and Their Management in Organic Agriculture. St. Paul, MN: APS Press.
- Fishel, F., W. Bailey, M. Boyd, B. Johnson, M. O'Day, L. Sweets, and B. Wiebold. 2009. IPM1006: Introduction to Crop Scouting. University of Missouri Extension. <http://extension.missouri.edu/explorepdf/agguides/pests/ipm1006.pdf>

- Florida Department of Agriculture and Consumer Services Citrus Insecticide Pollinator Protection Label Language- Interpretive Guidance. 2015.
http://www.freshfromflorida.com/content/download/35554/832609/Citrus_Bee_State_ments.pdf
- Folimonova, S.Y., A. S. Folimonova, S. Tatineni, and W.O. Dawson. 2008. *Citrus tristeza* virus: survival at the edge of the movement continuum. J. Virol. 82:6546-6556.
- Fungicide Additives. Texas Plant Disease Handbook. Texas A&M AgriLife Extension.
<http://plantdiseasehandbook.tamu.edu/problems-treatments/methods-and-materials/fungicide-additives/>
- Gergerich, R.C. and V. V. Dolja. 2006. Introduction to Plant Viruses, the Invisible Foe. The Plant Health Instructor. DOI: 10.1094/PHI-I-2006-0414-01
- Gottwald, T.R. 2010. Current epidemiological understanding of huanglongbing. Annu. Rev Phytopathology 48: 119-139.
- Graham, J.H., T.R. Gottwald, and R.P. Leite. 2006. Prospects for control of citrus canker with novel chemical compounds. Proceedings of Florida State Horticultural Society 119:82–88.
- Grogan, R.G. 1981. The science and art of plant-disease diagnosis. Annu. Rev. Phytopathol. 19:333-351.
- Gusmini, G., T.C. Wehner, and G.J. Holmes. 2002. Disease assessment scales for seedling screening and detached leaf assay for gummy stem blight in watermelon. Cucurbit Genet. Coop. Rpt. 25:36–40.
- Jones J. B., G.E. Vallad, F.B. Iriarte, A. Obradović, M.H. Wernsing, L.E. Jackson, et al. 2012. Considerations for using bacteriophages for plant disease control. Bacteriophage 2:208–214 10.4161/bact.23857
- Ma, Z., D. Felts, and T.J. Michailides. 2003. Resistance to azoxystrobin in *Alternaria* isolates from pistachio in California. Pestic. Biochem. Physiol. 77:66-74.
- Maas, J.L. and F.A. Uecker. 1984. *Botryosphaeria dothidea* cane canker of thornless blackberry. Plant. Dis. 68:720-726.
- McManus, P. and V. Stockwell. 2000. Antibiotics for Plant Diseases Control: Silver Bullets or Rusty Sabers. APSnet Features. Online. doi: 10.1094/APSnetFeature-2000-0600

- Obradovic, A., J.B. Jones, M.T. Momol, S.M. Olson, L.E. Jackson, B. Balogh, K. Guven, and F.B. Iriarte. 2005. Integration of biological control agents and systemic acquired resistance inducers against bacterial spot on tomato. *Plant Dis.* 89:712-716.
- Palmateer, A., K. Pernezny, M. Elliott, and N. Havranek. 2008. Guidelines for Identification and Management of Plant Disease Problems: Part III. Managing Plant Diseases. IFAS Extension Publication PP 250 (<https://edis.ifas.ufl.edu/mg443>).
- Paret, M., N. Dufault, T. Momol, J. Marois, and S. Olson. 2002. Integrated Disease Management for Vegetable Crops in Florida. IFAS Extension Publication PP-193 (<https://edis.ifas.ufl.edu/pp111>).
- Pavan, W., Fraisse, C. W., and Peres, N. A. 2011. Development of a web- based disease forecasting system for strawberries. *Comput. Electron. Agric.* 75:169-175.
- Pernezny, K., M. Elliott, A. Palmateer, and N. Havranek. 2011. Guidelines for identification and management of plant disease problems: Part II. Diagnosing plant diseases caused by fungi, bacteria and viruses. IFAS Extension Publication PP 249/MG442 (edis.ifas.ufl.edu/mg442).
- Putnam, M.L. 1995. Evaluation of methods of plant disease diagnosis. *Crop Protection* 14:517–25.
- Seebold, K. 2008. Bacterial Canker of Tomato. University of Kentucky – College of Agriculture Cooperative Extension Service. Plant Pathology Fact Sheet PPFS-VG-06 (http://www2.ca.uky.edu/agcollege/plantpathology/ext_files/PPFShtml/PPFS-VG-6.pdf).
- Seem, R.C. 1984. Disease incidence and severity relationships. *Annu.Rev. Phytopathol.* 22:137–50.
- Shober, A. and G. Denny. 2010. Identifying Nutrient Deficiencies in Ornamental Plants. IFAS Extension Publication SL 318 (<http://edis.ifas.ufl.edu>).
- Stansly, P.A., H.A. Smith, D.R. Seal, E. McAvoy, J.E. Polston, P.R. Gilreath, and D.J. Schuster. 2007. Management of whiteflies, whitefly-vectored plant virus, and insecticide resistance for vegetable production in southern Florida. IFAS Extension Publication ENY-735 (<http://edis.ifas.ufl.edu/pdffiles/IN/IN69500.pdf>).
- Wieczorek, P. and A. Obrępańska-Stęplowska. 2014. Suppress to survive – implication of plant viruses in PTGS A. *Plant Mol. Biol. Rep.* DOI: [10.1007/s11105-014-0755-8](https://doi.org/10.1007/s11105-014-0755-8)

PLP 6XXX: APPLIED PLANT DISEASE MANAGEMENT

3 CREDITS (GRADED), SUMMER A 2016, ONLINE (SEMI-SYNCHRONOUS)

"The phytopathologists are the trained plant doctors, the 'medicine men of agriculture,' whose final goal is successfully to prevent or control plant or crop diseases." *F. D. Heald. 1943. Introduction to Plant Pathology. New York: McGraw-Hill Book Company, p. 1.*

INSTRUCTOR: Carrie Lapaire Harmon, PhD

Building 1291, 2570 Hull Road
clharmon@ufl.edu
352-273-4640

OFFICE HOURS: Office hours are Monday-Friday 9-4 by appointment only; appointments must be requested by email (clharmon@ufl.edu) at least 48 hours in advance. Office hours may take place at Building 1291 (the Plant Diagnostic Center), by phone, or virtually via Lync, Skype, or Zoom. Course-related communications will be addressed once per day, between 9 am and 4 pm eastern.

COURSE WEBSITE: <http://lss.at.ufl.edu>

COURSE COMMUNICATIONS: Questions and discussion are encouraged; the majority of 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 clharmon@ufl.edu.

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

ADDITIONAL RESOURCES: Recommended texts will be available for reference in the Plant Diagnostic Center library during office hours: A Practical Guide to Turfgrass Fungicides by R. Latin; Fungicides for Field Crops, Eds. Mueller et al.; Current Vegetable Production Handbook for Florida, Eds. Santos et al.; Plant Pathology, Agrios et al, 5th edition or later; Essential Plant Pathology, Schumann and D'Arcy, 2nd Edition.

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 disease epidemic. Although this course is not intended as a primer in chemical

classes and modes of action, we will discuss management chemistries as they apply to specific cases. 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: BSC 2010/L or BOT 2010C and BSC 2011/L or BOT 2011C, or equivalent. 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 advance students' knowledge of management options for plant diseases, incorporating pathogen biology, epidemiology, 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; label and define the importance of the four components of the disease pyramid; contrast management vs. control; define IPM
- ✓ define types of inoculum, examples of initial vs continuous (monocyclic vs polycyclic)
- ✓ contrast disease incidence and severity
- ✓ identify common rating scales, describe potential pitfalls of disease assessment tools
- ✓ contrast bacterial disease symptoms and signs, name the diagnostic tests and expected results, discuss potential pathogen spread, discuss cultural/environmental factors conducive to bacterial disease development
- ✓ contrast viral disease symptoms and signs, name the diagnostic tests and expected results, vectors, identify vectors/means of spread, discuss cultural/environmental factors conducive to viral disease development
- ✓ contrast fungal disease symptoms and signs, name the diagnostic tests and expected results, discuss cultural/environmental factors conducive to fungal disease development, and define means of pathogen movement/spread
- ✓ recognize symptoms/signs of common abiotic and arthropod/other agent damage, identify the lab/agent who can identify each type of plant problem
- ✓ identify the information needed and samples required for submission to a lab, interpret lab results
- ✓ identify types of host resistance
- ✓ identify types of chemical resistance

- ✓ explain sanitation in a greenhouse, field, nursery setting; describe general and pathogen-specific cultural management tools
- ✓ understand how to find and interpret product labels
- ✓ understand how to find and interpret efficacy data
- ✓ identify potential biological management methods
- ✓ identify management component costs (labor, product, plant product quality/loss costs/benefits)
- ✓ define IPM, recognize the components of an integrated management plan
- ✓ calculate product application amounts, understand important points in sprayer calibration

HOW THIS COURSE RELATES TO THE STUDENT LEARNING OUTCOMES IN THE PLANT SCIENCE

PROGRAM: After completing this course, students will be able to: 1. evaluate the abiotic and biotic factors that impact plant growth and management, as they pertain to plant disease management; 2. recommend practices that growers and managers can implement to address the plant disease components of their cropping system; and 3. analyze and apply science-based data to solve disease problems in plant production. (Plant Science SLOs 1, 2, and 3).

TEACHING PHILOSOPHY: I see opportunity in meshing my extension and research programs with my teaching duties. The courses I teach tend towards those with practical applications. Experiential learning derived from participation in extension projects imbues coursework with real-world examples. There is additional potential for extension impact within the span of the semester, as the students apply their knowledge to solving the field and laboratory problems of extension clientele.

I encourage students to set high expectations for themselves, with a safety net of being able to work through a problem with me or their fellow students. Since my courses tend towards the applied, I employ practicum-style projects and examinations so students have an opportunity to demonstrate they have accomplished the course objectives over the course of the semester. When practical, I assign group projects to encourage students to gain additional perspectives for problem-solving. My assessment methods include quizzes, short papers, projects, and presentations so students have multiple avenues for polishing their communication skills. I have found that the best way to learn something is to teach it to others, so I encourage peer-to-peer learning and rubric-based evaluation opportunities. I strive to provide prompt evaluation and return grades quickly so students can incorporate the feedback.

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 and undergraduate level. The undergraduate version places more emphasis on building a knowledge base and interviewing a professional to develop relationships with potential employers and mentors. Lectures and most quizzes are the same for both graduate and undergraduate versions of the course. There is no final project for the undergraduate section.

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 week long 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 excel. 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 <https://lss.at.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	Percentage
Quizzes/short assignments	40%
Interview assignment	5%
Management plan project	25%
Discussion participation and grading others' assignments (peer-to-peer learning and evaluation opportunities)	5%
Final exam	25%

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 213, 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	200	
A-	90-93	191	
B+	87-89	185	
B	84-86	178	
B-	80-83	170	
C+	77-79	163	
C	74-76	157	
C-	70-73	149	
D+	67-69	142	
D	64-66	136	
D-	60-63	127	
E	<59.5	<126.5	
Total points		213	

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, often one week.

EXTRA CREDIT: Development of a short video or PowerPoint 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:

FINAL EXAM: June 15

This course will be taught as a series of modules. 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 9 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: May 9 – May 15		
Course overview	Review of syllabus, grading policy, expectations, how to get help, review accommodations responsibilities; explanation of flow of concepts	Discussion thread
Plant Disease Boot Camp I and II	What is a plant disease; disease pyramid; pathogen life cycles; management vs. control; conventional vs organic; art and science of diagnostics; importance of proper diagnosis; symptoms and signs, introduction to IPM	Quiz; Assignment: Organic vs. conventional production management Part I

Epidemiology	Disease progress curve; inoculum; monocyclic vs polycyclic diseases; disease cycle weak spots; incidence and severity; spread local and regional; how does management affect the disease progress curve?	Quiz
Week 2: May 16 – May 22		
Disease assessment, I and II	Disease assessment and rating scales	Assignments: 1. Cane canker disease; 2. Gummy stem bight rating
The label is the law, I and II	Reading a pesticide label, finding products, efficacy trials, emergency exemptions	Assignment: Label project
Identification and management of bacterial diseases	Symptoms, signs, diagnostic tests, cultural/environmental factors, potential means of spread, management options (resistance, chemical, cultural, biological)	Quiz
Week 3: May 23 – May 29		
Identification and management of viral plant diseases	Symptoms, signs, diagnostic tests, cultural/environmental factors, potential means of spread, management options (resistance, chemical, cultural, biological)	Quiz
Identification and management of fungal diseases	Symptoms, signs, diagnostic tests, cultural/environmental factors, potential means of spread, management options (resistance, chemical, cultural, biological)	Quiz
Fungicides and fungicides resistance	FRAC, modes of action, resistance management	
Confounding factors	Abiotic issues, nematodes, insects; vectors; asymptomatic hosts	
Plan of attack	What data to collect; scouting, sample collection; diagnosis; interpreting results	Assignments: 1. Sample submission; 2. Sample diagnosis; 3. Scouting & sample collection
Week 4: May 30 – June 5		
Current issues in applied disease management	Interview project – interview a professional applicator, extension specialist, pesticide regulator, or industry professional (grower, or chemical company marketing or R&D rep)	Assignment: Interview and synthesis

Recordkeeping and decision support	Management plan components and considerations; forecasting models	Assignment: Decision support systems
Economics of disease management	Thresholds, inputs, and decisions	Quiz; Game: Economics of disease management
Current issues in applied disease management	Final project (integrated management plan): develop an integrated management plan for disease X, for two scenarios; include chemical, cultural, sanitation, biological management options, decision support system considerations, etc.	
Week 5: June 6 – June 12		
Nozzle Talk Part I	Pesticide safety and application methods	
Nozzle Talk Part II	Calibration; Residential vs. Commercial Sprayers	
Organic agriculture	Serving the organic grower, from start to finish	
Ethics and responsibilities	Finding balance in our responsibilities and moral positions	
Feeding the future & climate change	What is sustainable ag? What does climate change have to do with this disease management?	Assignment: Write a position paper for presidential candidates
Current issues in applied disease management	Development of a comprehensive management plan for two scenarios	Assignments: 1. Integrated management plan draft; 2. Peer-review of drafts; 3. Final management plan
Putting it all together	Preparation for final exam	Assignment: Develop and submit 5 exam questions
Week 6: June 13 – June 17		
Final exam	Cumulative and timed, June 15	

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<http://teach.ufl.edu/docs/NetiquetteGuideforOnlineCourses.pdf>

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- (352) 392-HELP - select option 2
- <https://lss.at.ufl.edu/help.shtml>

** 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 <http://www.distance.ufl.edu/student-complaints> to submit a complaint.

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://distance.ufl.edu/student-complaints> for more details.

Assigned Readings

- Ade, J. and R.W. Innes. 2007. Resistance to Bacterial Pathogens in Plants. In eLS. Chichester: John Wiley & Sons Ltd. <http://www.els.net> DOI: 10.1002/9780470015902.a0020091
- Allen, T.W., A. Martinez, and L.L. Burpee. 2004. Pythium blight of turfgrass. The Plant Health Instructor. DOI:10.1094/PHI-I-2004-0929-01.
- Antignus, Y. 2001. Manipulation of wavelength-dependent behavior of insects: An IPM tool to impede insects and restrict epidemics of insect-borne viruses. Virus Res. 71:213-220.
- Broschat, T.K. 2008. Nutrient Deficiency Symptoms of Woody Ornamental Plants in South Florida. IFAS Extension Publication ENH1098.
- Carlson, G.A. and C.E. Main. 1976. Economics of disease-loss management. Annu. Rev. Phytopathol. 14:381-403.
- Common and Trade Names of Fungicides. Ct.gov
- Cultural practices for reducing crop diseases. Texas Plant Disease Handbook. Texas A&M AgriLife Extension. <http://plantdiseasehandbook.tamu.edu/problems-treatments/methods-and-materials/cultural-practices-for-reducing-crop-diseases/>
- Elliot, M., K. Pernezny, A. Palmateer, N. Havrane. 2008. Guidelines to Identification and Management of Plant Disease Problems: Part I. Eliminating Insect Damage and Abiotic Disorders. . IFAS Extension Publication PP248/MG441 (<http://edis.ifas.ufl.edu/mg441>).
- Elliot, M., K. Pernezny, A. Palmateer, N. Havrane. 2008. Guidelines for Identification and Management of Plant Disease Problems: Part IV. Plant Health Questions to Ask the Client. IFAS Extension Publication PP 251/MG444 (<https://edis.ifas.ufl.edu/mg444>).
- Equipment (Sprayers and Dusters). Texas Plant Disease Handbook. Texas A&M AgriLife Extension. <http://plantdiseasehandbook.tamu.edu/problems-treatments/methods-and-materials/equipment-sprayers-and-dusters/>
- Finckh, M.R., A.H.C. van Bruggen, and L. Tamm (Eds.). 2015. Plant Diseases and Their Management in Organic Agriculture. St. Paul, MN: APS Press.
- Fishel, F., W. Bailey, M. Boyd, B. Johnson, M. O'Day, L. Sweets, and B. Wiebold. 2009. IPM1006: Introduction to Crop Scouting. University of Missouri Extension. <http://extension.missouri.edu/explorepdf/agguides/pests/ipm1006.pdf>

- Florida Department of Agriculture and Consumer Services Citrus Insecticide Pollinator Protection Label Language- Interpretive Guidance. 2015.
http://www.freshfromflorida.com/content/download/35554/832609/Citrus_Bee_State_ments.pdf
- Folimonova, S.Y., A. S. Folimonova, S. Tatineni, and W.O. Dawson. 2008. *Citrus tristeza* virus: survival at the edge of the movement continuum. J. Virol. 82:6546-6556.
- Fungicide Additives. Texas Plant Disease Handbook. Texas A&M AgriLife Extension.
<http://plantdiseasehandbook.tamu.edu/problems-treatments/methods-and-materials/fungicide-additives/>
- Gergerich, R.C. and V. V. Dolja. 2006. Introduction to Plant Viruses, the Invisible Foe. The Plant Health Instructor. DOI: 10.1094/PHI-I-2006-0414-01
- Gottwald, T.R. 2010. Current epidemiological understanding of huanglongbing. Annu. Rev. Phytopathology 48: 119-139.
- Graham, J.H., T.R. Gottwald, and R.P. Leite. 2006. Prospects for control of citrus canker with novel chemical compounds. Proceedings of Florida State Horticultural Society 119:82–88.
- Grogan, R.G. 1981. The science and art of plant-disease diagnosis. Annu. Rev. Phytopathol. 19:333-351.
- Gusmini, G., T.C. Wehner, and G.J. Holmes. 2002. Disease assessment scales for seedling screening and detached leaf assay for gummy stem blight in watermelon. Cucurbit Genet. Coop. Rpt. 25:36–40.
- Jones J. B., G.E. Vallad, F.B. Iriarte, A. Obradović, M.H. Wernsing, L.E. Jackson, et al. 2012. Considerations for using bacteriophages for plant disease control. Bacteriophage 2:208–214 10.4161/bact.23857
- Ma, Z., D. Felts, and T.J. Michailides. 2003. Resistance to azoxystrobin in *Alternaria* isolates from pistachio in California. Pestic. Biochem. Physiol. 77:66-74.
- Maas, J.L. and F.A. Uecker. 1984. *Botryosphaeria dothidea* cane canker of thornless blackberry. Plant. Dis. 68:720-726.
- McManus, P. and V. Stockwell. 2000. Antibiotics for Plant Diseases Control: Silver Bullets or Rusty Sabers. APSnet Features. Online. doi: 10.1094/APSnetFeature-2000-0600

- Obradovic, A., J.B. Jones, M.T. Momol, S.M. Olson, L.E. Jackson, B. Balogh, K. Guven, and F.B. Iriarte. 2005. Integration of biological control agents and systemic acquired resistance inducers against bacterial spot on tomato. *Plant Dis.* 89:712-716.
- Palmateer, A., K. Pernezny, M. Elliott, and N. Havranek. 2008. Guidelines for Identification and Management of Plant Disease Problems: Part III. Managing Plant Diseases. IFAS Extension Publication PP 250 (<https://edis.ifas.ufl.edu/mg443>).
- Paret, M., N. Dufault, T. Momol, J. Marois, and S. Olson. 2002. Integrated Disease Management for Vegetable Crops in Florida. IFAS Extension Publication PP-193 (<https://edis.ifas.ufl.edu/pp111>).
- Pavan, W., Fraisse, C. W., and Peres, N. A. 2011. Development of a web- based disease forecasting system for strawberries. *Comput. Electron. Agric.* 75:169-175.
- Pernezny, K., M. Elliott, A. Palmateer, and N. Havranek. 2011. Guidelines for identification and management of plant disease problems: Part II. Diagnosing plant diseases caused by fungi, bacteria and viruses. IFAS Extension Publication PP 249/MG442 (edis.ifas.ufl.edu/mg442).
- Putnam, M.L. 1995. Evaluation of methods of plant disease diagnosis. *Crop Protection* 14:517–25.
- Seebold, K. 2008. Bacterial Canker of Tomato. University of Kentucky – College of Agriculture Cooperative Extension Service. Plant Pathology Fact Sheet PPFS-VG-06 (http://www2.ca.uky.edu/agcollege/plantpathology/ext_files/PPFShtml/PPFS-VG-6.pdf).
- Seem, R.C. 1984. Disease incidence and severity relationships. *Annu.Rev. Phytopathol.* 22:137–50.
- Shober, A. and G. Denny. 2010. Identifying Nutrient Deficiencies in Ornamental Plants. IFAS Extension Publication SL 318 (<http://edis.ifas.ufl.edu>).
- Stansly, P.A., H.A. Smith, D.R. Seal, E. McAvoy, J.E. Polston, P.R. Gilreath, and D.J. Schuster. 2007. Management of whiteflies, whitefly-vectored plant virus, and insecticide resistance for vegetable production in southern Florida. IFAS Extension Publication ENY-735 (<http://edis.ifas.ufl.edu/pdffiles/IN/IN69500.pdf>).
- Wieczorek, P. and A. Obrępańska-Stęplowska. 2014. Suppress to survive – implication of plant viruses in PTGS A. *Plant Mol. Biol. Rep.* DOI: [10.1007/s11105-014-0755-8](https://doi.org/10.1007/s11105-014-0755-8)



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December 1, 2015

CALS Curriculum Committee
Re: PLP4XXX/6XXX- Applied Disease Management

I am requesting Applied Disease Management, that is currently awaiting assignation of course numbers, to be approved and to be co-taught as a 4xxx/6xxx course. The students have requested this course, and there is not a course quite like it at the undergraduate or graduate level. The instructor, Dr. Carrie Harmon, believes that she would have significantly greater enrollment if both undergraduate and graduate students are allowed to have credit for this course.

As can be seen from the syllabus for each course, Dr. Harmon has clearly outlined differences in expectations between the 4xxx level course and the 6xxx level course. The undergraduate section places more focus on two position papers and the interview with a professional to give the student new perspectives on the field of plant pathology, while the graduate version includes a final assignment that integrates all their knowledge from this course and their graduate studies into a comprehensive management plan for two scenarios.

Thank you for your consideration.

Sincerely,

A handwritten signature in blue ink that reads 'Jeffrey B. Jones'.

Jeffrey B. Jones
Undergraduate and Graduate Coordinator