
INSTRUCTOR: Carrie Lapaire Harmon, PhD

Building 1291, 2570 Hull Road
claharmon@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 additional resources that are recommended.

ADDITIONAL RESOURCES: Required readings will be provided via the course website. 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. Plant disease management practices rely on anticipating occurrence of disease and attacking vulnerable points in the disease cycle. This course is a general overview of some of the many methods, measures, strategies, and tactics
used in the management of plant diseases. This course is not intended as a primer in chemical classes and modes of action, although we will discuss management chemistries as they apply to specific cases. Over the course of the semester, students will utilize basic knowledge of organismal biology, epidemiology, management chemistry, and economics to develop strategies for management of plant diseases.

**PREREQUISITE KNOWLEDGE AND SKILLS:** Basic knowledge of plant horticulture will be valuable in the interpretation of management strategies. An introductory course in plant pathology is strongly advised, but not required. Additionally, 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 incidence and severity
- identify common rating scales, define potential pitfalls of disease assessment tools
- contrast bacterial disease symptom and sign, name the diagnostic tests and expected results, discuss potential pathogen spread, discuss cultural/environmental factors conducive to bacterial disease development
- contrast viral disease symptom and sign, name the diagnostic tests and expected results, vectors, identify vectors/means of spread, discuss cultural/environmental factors conducive to viral disease development
- contrast fungal symptom and sign, name the diagnostic tests and expected results, discuss cultural/environmental factors conducive to fungal disease development, and define means of pathogen movement/spread
- name symptoms/signs of common abiotic and arthropod/other agent damage, identify the lab/agent who can identify
- 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
✓ apply unit conversions and application calculations
✓ 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 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 at least 24 hours PRIOR to the quiz/exam/project due date and time. Make-up quizzes may be allowed at the discretion of the instructor in such circumstances. 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! There is no make-up for the final exam, but you may take the exam early, with the instructor’s permission. Consult the instructor at least one week prior to the scheduled exam to request this option.

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 and times are firm; plan accordingly. Rare exceptions may be made in the event of an emergency, see the make-up policy above.
COURSE TECHNOLOGY: This course will be 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.

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. Accommodations are not retroactive, therefore, students should contact the office as soon as possible in the term for which they are seeking accommodations.

UNIVERSITY POLICY ON ACADEMIC MISCONDUCT: Academic honesty and integrity are fundamental values of the University community. Students should be sure that they understand the UF Student Honor Code at http://www.dso.ufl.edu/students.php.

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.

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/docs/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://evaluations.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://evaluations.ufl.edu/results.
**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-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.

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

- Counseling and Wellness resources
- Disability resources
- Resources for handling student concerns and complaints
- Library Help Desk support

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.

**GRADING POLICIES:**

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quizzes/short assignments</td>
<td>40%</td>
</tr>
<tr>
<td>Interview assignment</td>
<td>5%</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>A</td>
<td>94-100</td>
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<tr>
<td>A-</td>
<td>90-93</td>
</tr>
<tr>
<td>B+</td>
<td>87-89</td>
</tr>
<tr>
<td>B</td>
<td>84-86</td>
</tr>
<tr>
<td>B-</td>
<td>80-83</td>
</tr>
<tr>
<td>C+</td>
<td>77-79</td>
</tr>
<tr>
<td>C</td>
<td>74-76</td>
</tr>
<tr>
<td>C-</td>
<td>70-73</td>
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</tbody>
</table>

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. I round one decimal point, so an 83.5 becomes an 84, but an 84.4 becomes an 84.

**EXTRA CREDIT:** Development of a short video or PowerPoint on a specific topic related to disease management may be considered for an extra credit project. The objective of such a 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 considered the equivalent of a quiz, and will be added to the final points earned. The number of points earned for a specific project will be at the discretion of the instructor, based on the quality of the finished product.

**Course Schedule:**

**FINAL EXAM:** October 7

This course will be taught as a series of modules. You will need to complete the assessment at the end of each module before you can open a new module. Modules will be open for one week, from Monday at 12:00am until Sunday at 11:59pm. 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, 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.
<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:</td>
<td><strong>August 23 - August 30</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Course overview</td>
<td>Review of syllabus, grading policy, expectations, how to get help, review accommodations responsibilities; explanation of flow of concepts</td>
</tr>
<tr>
<td></td>
<td>Plant Disease Boot Camp I and II</td>
<td>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;</td>
</tr>
<tr>
<td></td>
<td>Epidemiology</td>
<td>Disease progress curve; inoculum; monocyclic vs polycyclic diseases; disease cycle weak spots; incidence and severity; spread local and regional; how much to sample; how does management affect disease progress curve?</td>
</tr>
<tr>
<td>2:</td>
<td><strong>August 30 - September 6</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Disease assessment, I and II</td>
<td>Disease assessment and rating scales</td>
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<tr>
<td></td>
<td>The label is the law, I and II</td>
<td>Reading a pesticide label, finding products, efficacy trials, emergency exemptions</td>
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<tr>
<td></td>
<td>Identification and management of bacterial diseases</td>
<td>Symptoms, signs, diagnostic tests, cultural/environmental factors, potential means of spread, management options (resistance, chemical, cultural, biological)</td>
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<tr>
<td>3:</td>
<td><strong>September 6 – September 13</strong></td>
<td></td>
</tr>
<tr>
<td>Identification and management of viral plant diseases</td>
<td>Symptoms, signs, diagnostic tests, cultural/environmental factors, potential means of spread, management options (resistance, chemical, cultural, biological)</td>
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<tr>
<td>-----------------------------------------------------</td>
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<td></td>
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<tr>
<td>Identification and management of fungal diseases</td>
<td>Symptoms, signs, diagnostic tests, cultural/environmental factors, potential means of spread, management options (resistance, chemical, cultural, biological)</td>
<td></td>
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<tr>
<td>Fungicides and fungicides resistance</td>
<td>FRAC, modes of action, resistance management</td>
<td></td>
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<tr>
<td>Confounding factors</td>
<td>Abiotic issues, nematodes, insects; vectors; asymptomatic hosts</td>
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<tr>
<td>Plan of attack</td>
<td>What data to collect; scouting, sample collection; diagnosis; interpreting results</td>
<td></td>
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</tbody>
</table>

4: **September 13 - September 20**

<table>
<thead>
<tr>
<th>Current issues in applied disease management</th>
<th>Interview project – interview a professional applicator, extension specialist, pesticide regulator, or industry professional (grower, or chemical company marketing or R&amp;D rep)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recordkeeping and decision support</td>
<td>Management plan components and considerations; forecasting models</td>
</tr>
<tr>
<td>Topic</td>
<td>Details</td>
</tr>
<tr>
<td>------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Economics of disease management</td>
<td>Thresholds, inputs, and decisions</td>
</tr>
<tr>
<td>Current issues in applied disease management</td>
<td>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.</td>
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<tr>
<td>5: September 20-September 27</td>
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<tr>
<td>Nozzle Talk Part I</td>
<td>Pesticide safety and application methods</td>
</tr>
<tr>
<td>Nozzle Talk Part II</td>
<td>calibration; residential vs. commercial sprayers</td>
</tr>
<tr>
<td>Organic agriculture</td>
<td>Serving the organic grower, from start to finish</td>
</tr>
<tr>
<td>Ethics and responsibilities</td>
<td>Finding balance in our responsibilities and moral positions</td>
</tr>
<tr>
<td>Feeding the future and climate change</td>
<td>What is sustainable ag? What does climate change have to do with this disease management? Write a position paper for the presidential candidates.</td>
</tr>
<tr>
<td>6: September 27-October 4</td>
<td></td>
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<tr>
<td>Current issues in applied disease</td>
<td>Management plan draft due, then peer-review of drafts, then submission of final management plan</td>
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<tr>
<td>management</td>
<td></td>
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<tr>
<td>------------</td>
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<tr>
<td>Putting it all together</td>
<td>Preparation for final exam; develop and submit 5 exam questions</td>
</tr>
<tr>
<td><strong>7:</strong> October 4 – October 7</td>
<td>Exam prep</td>
</tr>
<tr>
<td>Final exam</td>
<td>Cumulative and timed, October 7</td>
</tr>
</tbody>
</table>

**Disclaimer:** This syllabus represents my current plans and objectives; it is subject to change as the need arises. As we go through the semester, those plans may need to change to enhance the class learning opportunity. Such changes, communicated clearly, are not unusual and should be expected.