

Turf and Ornamental Entomology
ENY 3510 / ENY 5516
3 credits
Fall 2020

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Office Hours: TBD

Instructor Office Hours: Please schedule appointments with the TA or me via email. Insect specimens and plant damage specimens are available to examine in the lab, if requested in a timely manner.

COVID-19 Statement

Given the dynamic and unpredictable nature of the ongoing COVID-19 pandemic, please be prepared to adjust the course schedule and timeline as needed based on University guidelines and class needs. If you or a family member becomes ill with the virus, please let Dr. Dale know immediately and we will work with you to make the necessary accommodations. Dr. Dale and Matt Borden will take all of the necessary safety precautions (face coverings, social distancing, hand cleaning) when interacting with any student in the course and expect all students to do the same. Any student who comes to the lab or office that is not following UF COVID-19 safety guidelines will be asked to leave until they can return in compliance.

Course Website: Lectures can be accessed in Canvas, UF e-learning (elearning.ufl.edu). Students should view 2 narrated lectures each week to keep up with the schedule of topics, unless otherwise indicated. Student UF Gatorlink username and password are necessary to log into the system.

Course Communications: General questions of relevance to the whole class should be posted to the course's discussion board. Private questions may be sent to the instructor or teaching assistants via email to agdale@ufl.edu or m.borden@ufl.edu.

Recommended (but not required) text:

Urban Landscape Entomology
2019 Edition
Elsevier Academic Press
Author: David Held

Garden Insects of North America – The ultimate guide to backyard bugs
2018 Edition
Princeton University Press
Author: Whitney Cranshaw

E-Book available through the UF Library for free:

(must be on the UF VPN – <http://vpn.ufl.edu>)

(Once on the UF VPN, access the book at <http://jstor.org/stable/j.ctt1qft28g>). Book can be accessed online, but the publisher prohibits downloading onto Kindle or other e-reader devices. This book is also available in paperback and hardback for \$10 to \$45 if you are interested and can be found through book retail outlets or Amazon.

Required additional readings (e.g., research articles, book chapters) will be posted on the course website as PDF files. Students can choose to download and print these or read them online. Students enrolled in ENY5516 will have additional reading assignments available in the same format.

Additional Resources: Distance students are required to purchase their own insect collection kits if unable to travel to main campus in Gainesville, FL. On-campus students may check out supplies from the TA during office hours (or by appointment) in Steinmetz Hall room 3239 beginning the Monday following the end of the Drop/Add period. Any borrowed equipment must be returned before the end of the semester or the student will not receive a grade for the course. See the separate set of instructions for the collection for more information.

Course Description: This course explores the ecology and management of arthropods on turfgrasses and ornamental plants. We cover the identification, biology, ecology, and management of common arthropod families and species inhabiting plants in greenhouses, nurseries, and urban landscapes, primarily ornamental plants and turfgrasses, with emphasis on the Southeastern U.S. We emphasize the framework and concepts of integrated pest management (IPM) (the use of multiple strategies and management practices to reduce pests and pesticide use, and increase plant health).

Prerequisite Knowledge and Skills:

- At least sophomore standing is strongly recommended
- At least 1 semester of a college-level Biology course is recommended
- Students should be self-motivated, avoid procrastinating, and ask questions if needed.
- Students must have reliable access to a computer and basic computer skills to access course materials.

Purpose of Course: This semester-long course is intended to educate undergraduates, graduates, and professionals about the importance, ecology, and management of arthropods that live and/or feed on plants in urban landscapes. Students will learn to monitor, identify, and determine the best integrated pest management (IPM) practices to manage arthropod plant pests in these settings. It is a practical source of information that students can use in undergraduate or graduate degree programs, certificate programs, or even in preparing for the state pesticide applicator licensing exam.

Course Objectives:

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

- Recognize arthropods in different horticulturally-important orders and families by sight and by written description.
- Differentiate arthropod pest signs and symptoms, and troubleshoot problems on plants in various settings (e.g., lawns, golf courses, nurseries, greenhouses, or urban landscape plant beds)
- Explain the rationale behind different IPM tactics in turf and ornamental pest management
- Anticipate pest activity periods, evaluate turf and ornamental plant health, and create a practical management plan to solve arthropod pest problems
- Identify beneficial arthropods, explain their value in urban landscape systems, and how to promote their activity and benefits
- Appreciate the services and disservices associated with insects on plants where people live, work, and play

My Teaching Philosophy: I believe successful teaching requires presenting information in an organized, rational, and relatable way that generates student interest in the subject. I think being able to apply new knowledge to aspects of everyday life also helps students learn concepts and apply them. I strive to connect with students through my enthusiasm and personal experiences and hope to motivate them to learn more and retain the information. I aim for students who take this course to be able to integrate multiple disciplines (e.g., insect ecology, toxicology, pest management, horticulture), and see how such disciplines interact affect insects, the environment, and human life.

There are three overarching objectives of this course:

1. Increase student's appreciation and understanding of the value of insects and plants in urban ecosystems
2. Increase student's basic understanding of the identification and biology of insects
3. Increase student's applied critical thinking, problem solving skills, and communication skills

Course Policies:

"Attendance" Policy: Students should view 2 to 3 narrated lessons each week to keep up with the scheduled quizzes and tests. All course materials can be accessed in Canvas. Your UF Gatorlink username and password are needed to log into the system. If you are struggling with any concepts or topics, please contact me or the teaching assistant so that we can help. Let me know before you consider withdrawing – sometimes additional assistance or other options may exist so you can maximize your investment and still earn a passing grade.

Test Policy:

- Tests are **open-note, but must be completed on your own** (i.e., working with others during exams or copying and/or sharing test questions/answers with others, is prohibited). Each student's answers will be directly compared to ensure nobody has copied another's answer. You are bound by the UF Honor Policy.

- Tests will remain open for 80 minutes after they have been started, unless otherwise noted in Canvas.
- During each exam period, no student will have the same set of questions, although all questions will cover information relevant to that exam's material. Comparing answers will not improve an individual's grade.
- Exams will be a combination of multiple choice, true/false, matching, and short answer. The majority of your exam grades will come from short answer and essay questions.
- If the test is not finished within the 80-minute time period, it will be automatically submitted. You cannot reopen it or start it over.
- Save your answers frequently, in case of power failure or software glitches. Contact the UF Computing Help Desk (352-392-4357; helpdesk@ufl.edu) to document problems, or a makeup test/quiz cannot be offered.
- The grade displayed upon submission of a test or quiz is only a **partial score** if there were short answer or essay questions. Please allow the instructor a week for grading.
- Concerns about grades can be discussed privately after the assessment period has closed.

Exam 1 policy: Since this course is offered to undergraduates, graduates, and professionals from multiple disciplines, and does not require any pre-requisite entomology courses, Module 1 primarily focuses on introductory entomology material. Therefore, students enrolled in ENY5516 may opt-out of Module 1 by passing a pre-exam of information covered in Module 1. This pre-exam will be offered during the first week of class. Even if you opt-out of Module 1, you are still expected to read the assigned readings and know the basic entomology information covered in this Module.

Make-up Policy: No make-up tests or quizzes will be given unless the student makes previous arrangements with the instructor or can document an excused absence. Unexcused absences will receive a zero. Any requests for make-ups due to technical issues MUST be accompanied by the UF Computing Help Desk ticket, indicating the date and time when you reported the problem. You MUST e-mail the TA or me within 24 hours. I can still deny giving make-ups, as previously stated.

Assignment Policy: Late assignments will not be accepted without proper documentation of an emergency or technological problem. All written assignments must be submitted through Canvas, which will give it a timestamp of submission. Plan. Do not procrastinate.

Course Assignments:

Discussion board: There will be five opportunities over the course of the semester when **everyone** is expected to contribute to the course's discussion board. Each opportunity is worth 10 points towards your final course grade. Discussion topics will either focus on upcoming exam material or discussion of recent reading assignments. Worth 50 points.

IPM Project: **Everyone** enrolled in this course must complete the assigned IPM project. This project requires students to find an insect or mite pest of turfgrass or ornamental plants, document its presence and damage, and create an integrated pest management plan. This requires a synthesis of multiple topics covered in the course and provides students an opportunity to get hands on experience identifying a pest and developing a plan to manage it. This report is two pages max, and worth 100 points.

Insect Collection: **Everyone** enrolled in this course must prepare a small insect collection composed of insects relevant to turfgrasses and ornamental plants. I want students to become plant inspectors, get away from the computer, and see where these insects are living. You don't have to go far from your couch. Instructions on the number of specimens, acceptable orders and families, how to prepare specimens, the due date, etc., will be posted in a separate file under Assignments and discussed in one Lecture during Module 1. The insect collection is **the most valuable single assignment in this course, worth 125 points.**

To achieve the best score on the collection, follow the instructions, read the chapter on "Collecting and preserving insects" by D. J. Borror and R. E. White, and focus on pertinent lectures. I highly recommend collecting extra specimens, practicing your pinning technique on damaged or duplicate specimens, and using the best insects in your final collection. **DO NOT** mail vials inside a specimen box that also has pinned insects, or the collection will be destroyed in transit. Instead, place the vials (in a sealable bag) and specimen box inside another box, surround them with paper, bubble wrap, or other padding, and write FRAGILE around the outside of the box.

Featured Creature Article (ENY5516): **Students enrolled in ENY5516** must write a new Featured Creature article (for examples, <http://entomology.ifas.ufl.edu/creatures>). Students must suggest a topic and obtain approval before writing this article. The format for each article must conform to the required Featured Creature format (a file with instructions will be posted under Assignments).

After your topic is approved, you will write a thorough first draft and upload it to the *Assignments* page. I will then assign students enrolled in ENY5516 each other's first draft to peer-review and provide critical feedback on how to improve the article. I will review each student's peer reviews, provide additional feedback, and return them to the authors to make changes for the final version. A complete final draft will be submitted through *Assignments* in Canvas. Students must obtain permission for use of any illustrations/pictures from the photographer or illustrator.

Students interested in publishing their Featured Creature article can do so by creating a high-quality article and working with me to revise and submit it for the UF|IFAS peer-review process. This would most likely occur after the semester is over and is the student's responsibility, but is an excellent opportunity to enhance your CV. This article will also become an IFAS Extension publication if published as a Featured Creature article. This assignment is worth 100 points (25 from the peer-review process and 75 based on the quality and completeness of the article).

Communication Courtesy: All class members are expected to follow the rules of common courtesy in all communications, written and verbal. The file is on the course

homepage and can also be accessed at <http://teach.ufl.edu/wp-content/uploads/2012/08/NetiquetteGuideforOnlineCourses.pdf>.

Course Technology: A computer/device that can view PowerPoint and pdf files, has adequate memory and speed, and meets the minimum standards for UF computer use is required. The following website explains the University of Florida computer hardware and software policy: http://dell.techhub.ufl.edu/computer_requirement.html.

Getting Help:

For technical difficulties with E-learning in Canvas, please contact the UF Computing Help Desk (352-392-4357; helpdesk@ufl.edu). You will be issued a ticket number – **print and save this!**

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 before 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.

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 goals, which interfere with their performance. Other resources are available at <http://www.distance.ufl.edu/getting-help>.

University Counseling & Wellness Center, 3190 Radio Road, 352-392-1575, (<http://www.counseling.ufl.edu/cwc/>).

- Counseling Services
- Groups and Workshops
- Outreach and Consultation
- Self-Help Library
- Training Programs
- Community Provider Database

Career Resource Center, First Floor JWRU, 352-392-1601 (<http://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.

Grading Policies:

Grades will be based on cumulative points earned from each assignment:

- Participation in discussion board (50 points)
- 4 Exams (75 points each, 300 total)
- 10 Quizzes (7.5 points each, 75 total) – sum to replace lowest exam score
- Insect collection (125 points)

- IPM project (100 points)
- Featured Creature article (100 points) – ENY5516

Total possible points: 575 (ENY3510) / 675 (ENY5516)

Grading Scale:

A	94 – 100%
A-	90 – 93%
B+	88 - 89%
B	84 - 87%
B-	80 – 83%
C+	78 - 79%
C	73 - 77%
C-	70 – 73%
D+	68 - 69%
D	60 - 67%
E	< 60%

The UF Grading Policy is at:

<http://www.registrar.ufl.edu/catalog/policies/regulationgrades.html>.

Course Schedule: ENY 3510 / ENY5516: Turf and Ornamental Entomology

Module	Lesson	Reading	Assignment	Assessment
	1. Overview of the course and syllabus (8/31)	Syllabus	Submit “get to know you” in Canvas Due by: 9/3 11:59 PM	
1. Introduction to Entomology				
	1. Intro to Entomology & How Insects Become Pests (9/2)		View Dr. Dale seminar presentation recording	
	2. Arthropods & their Relatives (9/8)			
	3. Characteristics of Insects (9/10)	Destructive Turfgrass Insects, pp.19-24	ENY5516 STUDENTS: Due by 11:59 pm, 9/11: Featured Creature selection	Quiz 1 Open: 9/10
	4. Insect Biology & Physiology (9/14)	Destructive Turfgrass Insects, pp. 24-28		
	5. Classifying Horticulturally-important Orders (9/16)	Destructive Turfgrass Insects, pp.29-35. Garden Insects of North America, pp.1-5		
	6. Collecting & Preserving Insects (9/21)	Collecting & Preserving,	Insect Collection Assigned	Quiz 2 Open: 9/21

		Insect Collection Assignment		
2. Insects and Their Environment				
	1. Concepts of insect ecology (9/23)			
	2. Insect communication (9/28)			
	3. Plant-insect Interactions (9/30)	Indirect defense via tri-trophic interactions		Quiz 3 Open: 9/30
	4. Ecology of Herbivorous Insects in Urban Landscapes (10/5)	Managing insects with resistant plants		Exam 1 (lect. 1.1 – 2.4) Open: 10/5 -10/11
3. The Foundation: Integrated Pest Management				
	1. Strategies of integrated pest management (10/7)	Pests In & Around the FL Home, pp. 235-237		
	2. Monitoring tools and techniques (10/12)	Floric. & Nurseries, pp. 134-141; Turf sampling	ENY5516 STUDENTS: Due by 11:59 pm, 10/12: Featured Creature 1st Draft MUST be uploaded to Canvas	
	3. Biological control & ID of common predators & parasitoids (10/14)	Insect Structure & Function, pp. 44-47		Quiz 4 Open: 10/14
	5. Non-chemical controls of pests (10/19)	Trees, stress and pests		
4. Chemical Control of Insects				
	1. History of insecticide use (10/21)	Introduction to safe pesticide handling	ENY5516 STUDENTS: Due by 11:59 pm, 10/23: Featured Creature peer review MUST be uploaded to Canvas	Quiz 5 Open: 10/21
	2. Insecticide chemical classes, modes of action, and formulations (10/26)			
	3. “Natural” insecticides and home remedies (10/28)	Natural products for managing pests & Soaps for managing plant pests (pdf files)		Quiz 6 Open: 10/28
	4. Insecticide application technologies (11/2)			Exam 2 (lect. 3.1 – 4.4)

				Open: 11/2 – 11/8
5. Insect Pests of Ornamental Plants				
	1. Insect borers: Beetles (11/4)	Pests In & Around the FL Home, pp. 267-270	Due by 11:59 pm, 11/6: IPM program assignment DUE: Details in Canvas & discussed in lecture	
	2. Common defoliators (11/9)	Pests In & Around the FL Home, pp. 250-262		
	3. Common leafminers & gall makers (11/12)	Pests In & Around the FL Home, pp. 263-266		Quiz 7 Open: 11/12
	4. Sap-feeding insects: Bugs and mites (11/16)	Pests In & Around the FL Home, pp. 238-249		
6. Special Cases: Key Pests & Key Plants				
	1. Key pests in protected culture (11/18)	Pests In & Around the FL Home, pp. 271-273	ENY5516 STUDENTS: Due by 11:59 pm, 11/20: Upload Final Featured Creature to Canvas	Quiz 8 Open: 11/18
	2. Key pests of trees & shrubs (11/23)			Quiz 9 Open: 11/23
	3. Key pests of groundcovers, ornamental grasses, and flower beds (11/24)			Exam 3 (lect. 5.1 – 6.3) Open: 11/24 – 12/2
7. IPM in Turfgrass and Turfgrass Pests				
	1. Foliage feeders (11/30)	Pests In & Around the FL Home, pp. 209-214		
	2. Stem and/or thatch feeders (12/2)	Pests In & Around the FL Home, pp. 215-221 Graduate Students: Pgs. 271-273 in Pests In and Around the FL Home		

	3. Root feeders (12/7)	Pests In & Around the FL Home, pp. 222-228		Quiz 10 Open: 12/7
8. Other Considerations				
	1. The future of urban landscapes (12/9)	IPM, conservation, urbanization, global change	All insect collections due in lab by 5 pm on 12/9	Exam 4 (lect. 7.1 – 8.1) Open: 12/9 – 12/16

Final Exam: *No comprehensive final exam is given for this course.*

Disclaimer: This syllabus represents my current plans and objectives. As the semester progresses, those plans may need to change to accommodate unexpected events (e.g., hurricanes, pandemics). Such changes, communicated clearly, are not unusual and should be expected.

Important dates:

First day of class: 8/31

Drop/Add period ends: 9/4

Holidays: 9/7, 10/2, 11/11, 11/25 – 11/27

Last day of class: 12/9

Reading days: 12/10-12/11

Final exams: 12/12-12/18

Plagiarism: Plagiarism will result in consequences that put your future at UF in jeopardy. Plagiarism is defined as representing the words or ideas of another person as one's own, without attribution to the source. All words and ideas must be attributed to a source unless they are considered common knowledge (i.e., widely known by many people and found in many different sources). There are many kinds of plagiarism, as you will read on the Guide to Plagiarism website referenced below.

Plagiarism is unethical, unacceptable in academia, and prohibited by the UF Student Honor Code (<http://www.dso.ufl.edu/students.php>). The consequences for plagiarism while at the University of Florida range from receiving a grade of zero for the plagiarized assignment, a failing grade for the course, or, for repeated offenses, expulsion from the university. Plagiarism after graduate training calls into question one's scientific integrity and can lead to banning of publication in journals and the loss of jobs/careers.

In some countries, it is an acceptable practice to write in a manner that faculty members at the University of Florida consider to be plagiarism. Students studying in our university and with plans to publish their research in the English language need to know what plagiarism is and how to avoid it.

Students who plagiarize will be caught and consequences will be applied. I check all written assignments. Students who plagiarize will receive a grade of zero on the assignment. The second instance of plagiarism in the course will result in an automatic failing grade in the course.

Please understand that our purpose in bringing to your attention the matter of plagiarism is to help train you to be ethical scientists, not to impugn your character.

University Policy on Academic Misconduct: In 1995 the UF student body enacted an honor code and voluntarily committed itself to the highest standards of honesty and integrity. When students enroll at the university, they commit themselves to the standard drafted and enacted by students.

In adopting this honor code, the students of the University of Florida recognize that academic honesty and integrity are fundamental values of the university community. Students who enroll at the university commit to holding themselves and their peers to the high standard of honor required by the honor code. Any individual who becomes aware of a violation of the honor code is bound by honor to take corrective action. The quality of a University of Florida education is dependent upon community acceptance and enforcement of the honor code.

The Honor Pledge: We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.

On all work submitted for credit by students at the university, the following pledge is either required or implied: **"On my honor, I have neither given nor received unauthorized aid in doing this assignment."**

The university requires all members of its community to be honest in all endeavors. A fundamental principle is that the whole process of learning and pursuit of knowledge is diminished by cheating, plagiarism and other acts of academic dishonesty. In addition, every dishonest act in the academic environment affects other students adversely, from the skewing of the grading curve to giving unfair advantage for honors or for professional or graduate school admission. Therefore, the university will take severe action against dishonest students. Similarly, measures will be taken against faculty, staff and administrators who practice dishonest or demeaning behavior.

Students should report any condition that facilitates dishonesty to the instructor, department chair, college dean or Student Honor Court. (Source: 2012-2013 Undergraduate Catalog)

It is assumed all work will be completed independently unless the assignment is defined as a group project, in writing by the instructor. This policy will be vigorously upheld at all times in this course.

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.