

INSECT ECOLOGY

ENY 6203

3 credit hours

Fall 2013

Online sections

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Office Hours: Available by phone from 8:30 a.m. till 4:30 p.m. (Eastern Standard Time) or email during the work week. I will respond to your call or email within 24 hours. Please arrange Skype calls (after regular work hours if necessary) for more detailed questions.

Course Website: <http://lss.at.ufl.edu>

Course Communications: Please communicate with the instructor about private issues through the course management system. Questions about course content that may benefit from peer input can be posted on the class general discussion board. The discussion board is moderated by the class instructor.

Required Text: Speight, M. R., M. D. Hunter and A. D. Watt. 2008. Ecology of Insects: Concepts and Applications. 2nd ed. Wiley-Blackwell.

Course Description: This course is an introduction to the concepts in ecology with emphasis on insects. The relationships of insects with their biotic and physical environments, along with the roles of insects in nature, will be emphasized. The basics of ecological research will also be covered. This is one of the required courses in the entomology graduate curriculum.

Prerequisite Knowledge and Skills: ENY 3005/5006, or any introductory entomology course

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

- 1) Explain influences of an insect's biotic and abiotic environment on evolution of life histories;
- 2) Describe causes and effects of patterns of insect species abundance and distribution within ecosystems;

- 3) Describe fundamental ecological principles underlying the development and application of insect pest management and insect conservation;
- 4) Evaluate and critique ecological primary literature for content and scientific quality;
- 5) Translate scientific ecological literature into lay public-accessible scientific news.

Instructional Methods: Class material to be learned consists of readings from the assigned textbook and scientific journal articles, and narrated PowerPoint presentations, supplemented with videos or podcasts when available. Assignments to reinforce class material include short quizzes, online discussions, short writing assignments, and development of a PowerPoint presentation. Two midterm exams assess content mastery.

Course Policies

Attendance Policy: As this is an asynchronous online course, there are no requirements for synchronous participation. However, participation in asynchronous online discussions is mandatory.

Quiz/Exam Policy:

Quizzes are conducted online. Midterm exams are conducted by arrangement with a proctor. Exams are emailed to the proctor who administers and returns the completed exam within 24 hours. Suitable proctors include those people in a position of authority (work supervisors, faculty mentors) or assigned substitutes, and may be conducted at a place of work or at a suitable testing site (such as at the facilities of members of the National College Testing Association, <http://www.ncta-testing.org/cctc/find.php>).

Make-up Policy: Arrangements for a different date for the exam must be made at least one week prior to the exam date. If a student misses an exam due to a medical or family emergency (accompanied by a note from a medical professional), the exam will be rescheduled as soon as possible.

Assignment Policy: Late assignments will lose 25% of their score per day, including weekend days. Thus, if an assignment is more than four days late, the grade for the assignment will be zero. Assignments and exams must be submitted by 11:59 p.m. (Eastern Standard Time) on the day that they are due to get full credit.

Course Technology: The course is administered in E-learning through Sakai. Students will need a Gatorlink account to access the course web site (<http://www.gatorlink.ufl.edu/>). All students should have unlimited access to a computer with either Windows 7 or Mac OS X operating systems. Students should make sure to have access to a back-up computer in case of equipment failure. A high-speed Internet connection is highly recommended. Students will need speakers, microphone, and headphones to hear and record presentations. Microsoft Office PowerPoint is recommended for the presentation assignment but OpenOffice (freeware) may suffice <http://www.openoffice.org/>.

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

Plagiarism is a serious problem in academia today, especially with the ease of obtaining information from the World Wide Web. 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. One of the most common forms is insufficient paraphrasing. Even with attribution, you may be guilty of insufficient paraphrasing because your sentence too closely follows the content and structure of the cited author's sentence.

Plagiarism is unethical, unacceptable in science, and prohibited by the UF Student Honor Code (<http://www.dso.ufl.edu/sccr/honorcodes/honorcode.php>). The consequences for plagiarism while at the University of Florida range from receiving a grade of zero for the plagiarized assignment or a failing grade for the course, to, 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 being 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 using anti-plagiarism software called Turnitin® (http://turnitin.com/en_us/products/originalitycheck). 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.

For further information and examples of plagiarism, I strongly suggest that you read the George Smathers' Library Guide to Plagiarism at <http://www.uflib.ufl.edu/msl/07b/students.html>

UF Policies

Academic Honesty

As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: *"We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity."* You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied: *"On my honor, I have neither given nor received unauthorized aid in doing this assignment."*

It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: <http://www.dso.ufl.edu/SCCR/honorcodes/honorcode.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.

Services for Students with Disabilities

The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues. Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation

0001 Reid Hall, 352-392-8565, www.dso.ufl.edu/drc/

Netiquette: Communication Courtesy

All members of the class are expected to follow rules of common courtesy in all email messages, threaded discussions and chats. <http://teach.ufl.edu/wp-content/uploads/2012/08/NetiquetteGuideforOnlineCourses.pdf>

Getting Help

For issues with technical difficulties for E-learning in Sakai, 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

Complaints: 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

Assignment	Percentage
Midterm exams (2)	50
A narrated 10-minute PowerPoint presentation on an ecological topic	15
A 300-word written scientific abstract of the presentation, with references	5
Participation in informal weekly discussion topics	6
Paper review and discussion participation (3)	9
Online quizzes (4)	8
Insect ecology in the news (1)	7

Online quizzes. These consist of multiple choice and short answer questions. Quiz 1 covers “Introduction to insect ecology” to “Introduction to herbivory”; Quiz 2 covers “Plant defenses and insect counter defenses” to “Natural enemy behavioral ecology”; Quiz 3 covers “Predator-prey and host-parasite interactions” to “Life history strategies”; Quiz 4 covers “Insects in ecosystems” to “Factors affecting community structure”. Quizzes are online, open book but DO NOT COPY answers directly from online or class resources.

Informal weekly discussion topics. There are 6 weekly discussion topics, usually based on watching a video, reading a blog or listening to a podcast. Questions are posed in the Discussions section of Sakai. Respond to the questions and to other students’ response, if you want, for full points.

Midterms. These consist of sentence definitions, short paragraph and longer essays. Each exam will cover only the material specified and will not be cumulative. Midterm 1 covers “Introduction to insect ecology” to “Predator-prey and host-parasite interactions”; Midterm 2 covers “Insect defenses against enemies” to “Factors affecting community structure”. Exams are proctored, 2 hours in length, and closed book.

Insect ecology in the news. This consists of an essay comparing and contrasting the presentation of a current insect ecology topic in the news with the original scientific publication from which the scientific content was drawn. A specific content rubric will be supplied. Suggested sources for insect ecology in the news are:

Science Daily http://www.sciencedaily.com/news/plants_animals/insects_and_butterflies/,
Science Magazine <http://news.sciencemag.org/sciencenow/entomology-1/>,
The New York Times <http://topics.nytimes.com/topics/news/science/topics/insects/index.html>.

Paper reviews and discussion. Three recent papers from the primary scientific literature will be assigned over the course of the semester. Papers will be read critically following the Guide to Critical Reading of Scientific Literature on page 10. The questions shown below will be posed in the Discussion section of the course management system and answers will be expected by the due dates indicated.

In five short paragraphs, address the following discussion questions:

1. State the main hypothesis and the over-arching larger scientific area examined in this paper.
2. State the main conclusions.
3. How convincing were their results and do they support the conclusions? (i.e., did they set up the experiments and analyze the data correctly?)
4. What you would have done differently, if anything?
5. What is the next direction this research group should take based on these results?

Paper 1 - Raffa, K.F., E. N. Powell, and P.A. Townsend. 2013. Temperature-driven range expansion of an irruptive insect heightened by weakly coevolved plant defenses. PNAS 110: 2193-2198.

Paper 2 - Malé, P.-J., J.-B. Ferdy, C. Leroy, O. Roux, J. Lauth, A. Avilez, A. Dejean, A. Quilichini, and J. Orivel. 2013. Retaliation in response to castration promotes a low level of virulence in an ant-plant mutualism. *Evol. Biol* DOI 10.1007/s11692-013-9242-7

Paper 3 - Strickland, M.S., D. Hawlena, A. Reese, M. Bradford, and O. Schmitz. 2013. Trophic cascade alters ecosystem carbon exchange. PNAS 110:11035-1103.

Presentation and scientific abstract. The oral presentation consists of a narrated 10-minute PowerPoint presentation on an ecological topic that is not covered in detail in class. If preparing a standard research presentation is not useful to you, we can discuss doing a teaching, training or extension kind of presentation, but still focusing on an ecological subject. The abstract describes the main details of your talk using standard format in scientific journals. More details are found on page 9 of the syllabus.

Grading Scale: Grades will be based on the following scale:

A, 93-100; A-, 90-92; B+, 87-89; B, 83-86; B-, 80-82; C+, 77-79; C, 73-76; C-, 70-72; D, 60-69; E, <60.

For information on current UF policies for assigning grade points, see <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

Course Schedule

Week	Start module	Topic of PowerPoint module	Reading	Assignment	Due date
1	Aug. 21	Introduction to insect ecology	Speight, Chap. 1		
2	Aug. 26	Insects and climate	Speight, Chap. 2, Chap. 7 (7.4-7.7)		
3	Sept. 2	Introduction to herbivory	Speight, Chap. 3 <i>Paper 1</i>	Paper discussion 1	Sept. 6
4	Sept. 9	Plant defenses and insect counter defenses		Quiz 1	Sept. 11
5	Sept. 16	Resource niche and competition	Speight, Chap. 4		
6	Sept. 23	Natural enemy behavioral ecology	Speight, Chap. 5	Insect ecology in the news	Sept. 27
7	Sept. 30	Predator-prey and host-parasite interactions		Quiz 2	Oct. 2
8	Oct. 7	Insect defenses against enemies		Midterm 1	Oct. 9
9	Oct. 14	Mutualisms	Speight, Chap. 6, Chap. 7 (7.1-7.3, 7.8-7.10) <i>Paper 2</i>	Paper discussion 2	Oct. 18
10	Oct. 21	Pollination			
11	Oct. 28	Life history strategies			
12	Nov. 4	Insects in ecosystems	Speight, Chap. 8	Quiz 3	Nov. 6
13	Nov. 11	Sampling insect populations		First draft scientific abstract, and references	Nov. 15
14	Nov. 18	Measuring community structure	Speight, Chap. 9 <i>Paper 3</i>	Paper discussion 3	Nov. 22
15	Nov. 25	Factors affecting community structure		Quiz 4	Nov. 26
16	Dec. 2	None		Final draft presentation, abstract, and references Midterm 2	Dec. 2 Dec. 4

Disclaimer: This syllabus represents my current plans and objectives. 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.

Class Presentation

The class presentation can cover any specific topic relating to insect ecology but should not be your own current or past research. Grades will be assigned on a formal 10-minute narrated PowerPoint presentation, a scientific abstract, and a list of the primary literature references that were consulted to research the presentation topic. **Please confirm your choice of topic on or before xxx.**

Topic Your presentation will be a talk similar to what you may have seen/heard at a national, regional or state entomology meeting. Use 2 or 3 of the papers as background information and rationale for the studies that you are going to describe. Then describe select experiments from 2 of the papers in a research talk format including title, introduction, materials and methods, results, and significance/conclusions/implications.

Your topic should focus on specific examples, and not on general principles. Some examples:

Too general - Mating disruption as a tool for insect pest management
Good - Mating disruption to control codling moth in Washington plum orchards

Too general - Effect of climate change on arthropod-borne diseases
Good - Potential effect of climate change on incidence of malaria in Florida

Too general - Factors influencing insect diversity in North America
Good - Effect of habitat disturbance on insect diversity in Florida sand dunes

Reference List It will be necessary to consult recent primary literature (i.e., research articles in journals) to prepare your presentation. A list of five correctly cited publications (in the style of *Environmental Entomology*¹) is required.

Abstract A scientific abstract is required and is limited to 300 words. "The abstract should: 1) state the principal objectives and scope of the investigation, 2) describe the methodology employed, 3) summarize the results, and 4) state the principal conclusions"².

¹ Consult the Entomological Society of America Style Guide's References cited section at the following URL for the correct citation format:

<http://www.entsoc.org/Pubs/Publish/Style/index.htm>

² Excerpted from R. A. Day. 1998. *How to Write and Publish a Scientific Paper*. Oryx Press, Phoenix, AZ.

Available for internet checkout at <http://web.ebscohost.com/ehost/detail?sid=94d2e9a2-38f5-4817-8f97-9d72480a8333%40sessionmgr110&vid=1&hid=113&bdata=JnNpdGU9ZWZwhvc3QtbGl2ZQ%3d%3d#db=nlebk&AN=7615>

Critical Reading of Scientific Articles

Whenever you read a primary journal article, think about the following questions. Just because a paper has been published in a scientific journal, does not necessarily mean it was good science or it was well-written. As you are reading the assigned journal articles, think about these questions.

1. What are the specific hypotheses (and alternative hypotheses) or questions that are being explored?
2. Do the authors relate the specific hypotheses to a larger area of science (i.e., the “big picture”)?
3. Do the hypotheses follow logically from the background material that is presented in the Introduction section?
4. Do the authors make specific predictions of outcomes after manipulative experiments or was their study purely descriptive or comparative?
5. Are the experimental design and the methods used appropriate to answer their questions?
6. Are the methods described well enough to be repeated by other research groups?
7. How were the data analyzed? Was the analysis appropriate or can you think of a better way to do it? Think also if the data could have been collected differently to facilitate the analysis.
8. Are the data portrayed effectively in figures and tables? Are they clear and necessary or could the data have been presented in the text?
9. Do the results match the predictions the authors made?
10. If results differ from predictions or from the published research of other groups, do they address the differences and suggest reasons?
11. What are the authors’ conclusions? Would you have reached the same conclusion from these results? Have they made a strong case for their conclusions? What else could you propose to bolster their conclusions? What kinds of data would have convinced you?
12. What are the implications of these findings for the subfield and entomology more generally? How can these findings be extended into the “big picture”.
13. Where should this research go next? What should the next experiments be?
14. You may also think about the quality of the presentation of the article. Does the paper tell a nicely packaged “story” with sound reasoning throughout the paper? Are there areas where the paper wanders from the argument? Are the major points of the paper accurately and consistently presented in the title, abstract, key words, introduction and conclusions? Was the writing easy to understand, interesting, and not too wordy?