

TROPICAL ENTOMOLOGY

ENY 5566

Summer A 2017

Credits: 3

PRINCIPAL INSTRUCTORS:

Ronald D. Cave
Indian River REC
772-577-7378
rdcave@ufl.edu

Jacqueline Y. Miller
McGuire Center for
Lepidoptera and Biodiversity Studies
352-273-2016
jymiller@ufl.edu

LECTURERS:

Jaret Daniels
Entomology and
Nematology Dept.
352-273-3916
jcdnla@ufl.edu

Jamie Ellis
Entomology and
Nematology Dept.
352-273-3924
jdellis@ufl.edu

Phillip Kaufman
Entomology and
Nematology Dept.
352-273-3975
pkaufman@ufl.edu

Andrea Lucky
Entomology and
Nematology Dept.
352-273-3952
alucky@ufl.edu

Rudi Scheffrahn
Ft. Lauderdale REC
954-577-6312
rhsc@ufl.edu

COURSE OBJECTIVES:

This course provides the student an overview of the ecology, diversity, and agricultural and veterinary importance of insects in the tropics. Insects are the most diverse multicellular organisms in the tropics. Their roles in nature have diversified into most habitats where they are fungivores, herbivores, necrophages, coprophages, saprophages, parasitoids, parasites, and predators. They provide critical ecosystem services such as decomposition, nutrient recycling, pollination, and biological control. Tropical insects are used as bioindicators of ecosystem health and conservation needs, in butterfly farming, live material in insect zoos, and models in literature, art, and sculpture..

In this course, the student will learn:

1. Basic concepts about the tropics and tropical ecosystems;
2. Faunistic richness of insects in the tropics;
3. Seasonality and survival in tropical environments;
4. Ants, termites, and dung beetles in tropical environments;
5. Insect conservation;
6. Tropical insect-plant interactions;

7. Pollination of tropical plants by insects;
8. Mimicry in tropical insects;
9. Entomophagy in the tropics;
10. Economic importance of tropical insects in tropical crops;
11. Medical and veterinary importance of tropical insects.

COURSE FORMAT:

The **NARRATED POWERPOINT PRESENTATIONS** (PPTs) form a series of 14 lectures covering 11 basic themes. All presentations are available on Sakai. These lectures should be viewed before the appropriate discussion session (see Course Outline) so that the student is capable of answering questions posed during the session or (for asynchronous students) providing responses to written questions. Also, the student should come prepared with any questions of his/her own.

Most lectures are accompanied by a **READING ASSIGNMENT**. These publications should be read before the student arrives to the appropriate discussion session. The purpose of these readings is to provide further information on the lecture topics.

The **VIDEOCONFERENCED DISCUSSION SESSIONS** (MWF 9:30-10:45 am) are periods during which the students will have an opportunity to ask questions, request clarification on specific topics in the lectures and reading assignments, and share experiences and opinions. In addition, each lecture has an assignment of five discussion questions. Please review the discussion questions and consider the answers that can be found in the related Lecture and Assigned Reading. Prepare complete answers to each question in your own words for use in the upcoming videoconference discussion sessions. Students should be willing to share opinions, perceptions, and experiences in class.

The **EXAMS** are on-line. The midterm exam will cover all lecture and reading assignments up to and including Lecture 7 (Ants in Tropical Ecosystems). The final exam will cover Lectures 8-14 and their associated reading assignments. The final exam is not cumulative. The format of the exam is in two parts. Part 1 has 35 multiple-choice questions (1 point each). Part 2 has 14 short answer questions (5 points each). There will be a time limit for each part.

The **GRADUATE STUDENT ORAL PRESENTATION** is a synthesis of information from literature and/or experience on a topic directly related to any aspect of tropical entomology. The topic of the presentation will be decided by mutual agreement between Dr. Cave and the graduate student. The topic of the presentation must be finalized no later than **May 17, 2017**. No two presentations may be done on the same topic, so decide on a topic and have it finalized with Dr. Cave soon. PowerPoint slides must be utilized as visual aids, and these are to be delivered to the instructor in their final form on **June 15, 2017**, along with a maximum 300-word abstract with a list of at least five references (not cited in abstract) and no more than eight. At least three journal articles or books must be included in the list and no more than four websites; provide the complete reference of all literature cited and the title and URL for all websites cited. Use of information gathered from Wikipedia is not allowed. The presentations will be delivered to the class on **June 16,**

2015. Duration of the oral presentation shall be 10-12 minutes per student. There will be a brief question and discussion period with the class immediately following each oral presentation.

NOTE: If there are more than six graduate students enrolled in the course, then the oral presentations will occur on June 14 and June 16. The final exam date will possibly be rescheduled.

TROPICAL FEATURED CREATURE ARTICLE: Each student is required to develop a “Featured Creature” (FC) fact sheet on an insect of the tropics that is NOT CURRENTLY AVAILABLE in or planned for FC (<http://creatures.ifas.ufl.edu/>). Students must upload their first draft and final draft documents to Sakai. Use the “Assignments” feature of Sakai to complete the upload. All deadlines are midnight of the day that they are due. Late submissions will be docked 10% on the individual component grade for each 24 hrs after **each** deadline.

The Tropical Featured Creature article grade will be determined through a multi-step evaluation process that includes topic approval, submission of a first draft, return of review evaluation, and submission of a final draft. Please be sure to read the following to ensure that you are meeting the deadlines. Visit http://entomology.ifas.ufl.edu/creatures/FC_format.pdf for the FC-specific guidelines.

1. Students must contact Dr. Cave to receive approval for their topic **BEFORE** proceeding. **The topic must be chosen by May 15, 2017.** (10 pts.)
2. To be eligible for full credit, the first draft must be submitted to Dr. Cave in electronic form (Sakai ASSIGNMENT link) by **June 7, 2017.** These are expected to be nearly complete documents with significant material provided in each category. Dr. Cave or one of the other instructors in that area of specialization will review and score these drafts for effort, form, and overall progress. (40 pts.)
4. Final drafts of papers are due on **June 16, 2017.** You will be scored on the completeness of the overall document, thoroughness of the subject matter, incorporation of appropriate original artwork, incorporation (or not) of suggested revisions provided by the instructors (not all suggestions must be incorporated, but you must justify when recommendations are not incorporated), and proper grammar and punctuation. (50 pts.)

PARTICIPATION at all videoconferenced discussion sessions is required. Interactive discussion is a critical component of this class, so students should come prepared by having read the assigned reading material and viewed the lecture presentations. Each lecture has an assignment of five discussion questions. Please review the discussion questions and consider the answers found in the related Lecture and Assigned Reading found in the Lessons area. Prepare complete answers to each question in your own words for use in the upcoming videoconference discussion sessions. Students should be willing to share opinions, perceptions, and experiences in class. For attendance at each of any 12 discussion sessions from May 10 to June 16, 7.5 points will be awarded; therefore, students may miss two discussion sessions during this period without penalty.

STUDENT LEARNING ASSESSMENT:

Two exams (105 points each)	210 pts
Oral presentation (90%) and abstract (10%)	100 pts
Tropical Featured Creature	100 pts
<u>Participation</u>	<u>90 pts</u>
TOTAL	500 pts

GRADES AND GRADE POINTS:

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

A	= 93-100%
A-	= 90-92%
B+	= 86-89%
B	= 83-85%
B-	= 80-82%
C+	= 76-79%
C	= 73-75%
C-	= 70-72%
D+	= 66-69%
D	= 63-65%
D-	= 60-62%
E	= 0-59%

NOTE: This course is co-taught with ENY3563. Students registered for ENY5566 have requirements different from those for ENY3563 students.

COURSE OUTLINE 2017**May 8, Monday**

- Introductions, discussion of course format, syllabus, and student performance expectations
- Lecture 1: Ecological Diversity and the Tropics – R. Cave

May 10, Wednesday

- Discussion of Lecture 2: Faunistic Richness of Insects in the Tropics – J. Miller

May 12, Friday

- Discussion of Lecture 3: Seasonality and Survival in Tropical Environments – J. Miller

May 15, Monday

- Discussion of Lecture 4: Dung Beetle Ecology in the Tropics – R. Cave

May 17, Wednesday

- Discussion of Lecture 5: Termites in Tropical Ecosystems – R. Scheffrahn

May 19, Friday

- Discussion of Lecture 6: Insect Conservation – J. Daniels

May 22, Monday

- Discussion of Lecture 7: Ants in Tropical Ecosystems – A. Lucky

May 24, Wednesday

- Midterm exam

May 26, Friday

- Discussion of Lecture 8: Tropical Insect-Plant Associations I – R. Cave

May 29, Monday

- Memorial Day

May 31, Wednesday

- Discussion of Lecture 9: Tropical Insect-Plant Associations II - R. Cave

June 2, Friday

- Discussion of Lecture 10: Insect Pollinators of Tropical Plants – J. Ellis

June 5, Monday

- Discussion of Lecture 11: Mimicry in tropical insects; entomophagy – R. Cave

June 7, Wednesday

- Discussion of Lecture 12: Insects in Tropical Agriculture I – R. Cave

June 9, Friday

- Discussion of Lecture 13: Insects in Tropical Agriculture II – R. Cave

June 12, Monday

- Discussion of Lecture 14: Medical and Veterinary Importance of Tropical Insects – P. Kaufman

June 14, Wednesday

- Graduate student presentations

June 16, Friday

- Final Exam

ASSIGNED READING

Lecture 1:

No reading assignment.

Lecture 2:

Wiens, J. J., and M. J. Donoghue. 2004. Historical biogeography, ecology, and species richness. *Trends in Ecology and Evolution* 19: 639-644.

Lecture 3:

Novotny, V., and Y. Basset. 2005. Host specificity of insect herbivores in tropical forests. *Proceedings of the Royal Society B* 272:1083-1090.

Lecture 4:

Nichols, E., S. Spector, J. Louzada, T. Larsen, S. Amezcua, M. E. Favila, and The Scarabaeine Research Network. 2008. Ecological functions and ecosystem services provided by Scarabaeinae dung beetles. *Biological Conservation* 141: 1461-1474.

Lecture 5:

Constantino, R., and A. N. S. Acioli. 2006. Termite diversity in Brazil (Insecta: Isoptera) [pp. 117-128]. *In: Soil Biodiversity in Amazonian and other Brazilian Ecosystems* (F. M. S. Moreira, J. O. Siqueira, and L. Brussaard, editors). CAB International, Egham, Surrey, UK.

Lecture 6:

Cardoso, P., T. L. Erwin, P. A. V. Borges, and T. R. New. 2011. The seven impediments in invertebrate conservation and how to overcome them. *Biological Conservation* 144: 2647-2655.

Lecture 7:

Klimes, P., C. Idigel, M. Rimandai, T. M. Fayle, M. Janda, G. D. Weiblen, and V. Novotny. 2012. Why are there more arboreal ant species in primary than in secondary tropical forests? *Journal of Animal Ecology* 81: 1103-1112.

Lecture 8:

Richards, L. A., and D. M. Windsor. 2007. Seasonal variation of arthropod abundance in gaps and the understorey of a lowland moist forest in Panama. *Journal of Tropical Ecology* 23: 169-176.

Lecture 9:

Bronstein, J. L., R. Alarcón, and M. Geber. 2006. The evolution of plant–insect mutualisms. *New Phytologist* 172: 412-428.

Lecture 10:

Bawa, K. S. 1990. Plant-pollinator interactions in tropical rain forests. *Annual Review of Ecology and Systematics* 21: 399-422.

Lecture 11:

TBD

Lecture 12:

Neuenschwander, P. 2001. Biological control of the cassava mealybug in Africa: a review. *Biological Control* 21: 214–229.

Lecture 13:

Perfecto, I., J. Vandermeer, P. Hanson, and V. Cartín. 1997. Arthropod biodiversity loss and the transformation of a tropical agro-ecosystem. *Biodiversity and Conservation* 6: 935-945.

Lecture 14:

Reisen, W. K. 2009. Epidemiology of vector-borne diseases [pp. 19-33]. *In: Medical and Veterinary Entomology, Second Edition* (G. R. Mullen and L. A. Durden, editors). Academic Press, New York, NY.

Absences and Make-Up Work

Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies that can be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>.

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.

Campus Helping Resources

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
 Training Programs
 Community Provider Database
- *Career Resource Center, First Floor JWRU, 392-1601, www.crc.ufl.edu/*

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/

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 www.distance.ufl.edu/student-complaint-process.

Plagiarism

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.

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 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. Many faculty in our department check all written assignments using an anti-plagiarism software called Turnitin® (<http://www.at.ufl.edu/~turnitin/about.html>).

For further information and examples of plagiarism, I **strongly suggest** that you please read the George Smathers' Library Guide to Plagiarism at http://www.uflib.ufl.edu/msl/services/tutorials/plagiarism/student_intro.html

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.