

Seminar Insect Resistance Management to Insecticides
ENY 6934, 1 credit
Fall 2017- Sections: Gainesville and Distance



extension.entm.purdue.edu

Instructors: Blair Siegfried
1019 Steinmetz Hall
1881 Natural Area Dr.
Gainesville, FL 32611
(352) 273-3970
bsiegfried1@ufl.edu

Dr. Silvana V. de Paula-Moraes
Jay Admin Rm. 11
UF/IFAS West Florida Research and Education Center
4253 Experiment Rd., Hwy. 182
Jay, FL 32565
850-983-7101
paula.moraes@ufl.edu

Class period: Monday, 1-3pm

Room: 1031 Steinmetz Hall and by Distance

Office hours: Immediately after class and at other times by appointment

Course Description: This course is one of the seminar courses offered each semester in the Department of Entomology & Nematology to meet the core course requirements. The purpose of these seminars is to give students practice in preparing and presenting a 35-40 minute seminar on a topic that interests them. Master's students are required to take one credit of seminar and PhD students take two credits. This seminar focuses on current topics in insect resistance management to insecticides.

Objectives and Goals:

- Learn principles and terminology used to describe the evolution, ecology and management of insecticide resistance;
- Become familiar with general biochemical and genetic mechanisms of resistance
- Define insect resistance and describe methods used in bioassays to determine the susceptibility of insects to different groups of insecticides and Bt toxins;
- Learn how to interpret the results of toxicology bioassays;
- Learn the factors and considerations influencing the resistance evolution: genetic, ecological and operational factors;
- Describe the basics of an insect resistance management program;
- Hot topics in insect resistance evolution;
- Learn to read journal articles critically.
- Learn and practice how to organize and perform an oral presentation in a 35-40 minute teaching-type seminar.

Distance access:

Join from PC, Mac, Linux, iOS or Android: <https://ufl.zoom.us/j/259461639>

Or iPhone one-tap (US Toll): +14086380968,,259461639# or +16465588656,,259461639#

Or Telephone:

Dial:

+1 408 638 0968 (US Toll)

+1 646 558 8656 (US Toll)

Meeting ID: 259 461 639

Or Skype for Business (Lync):

<https://ufl.zoom.us/skype/259461639>

Please mute your microphone when not speaking.

Topics to be covered:

During the first six weeks of class, the instructors will lecture to introduce students to the topics of insect resistance evolution, factors influencing insect resistance, and aspects to be considered when designing an insect resistance management program. The instructors will also present and discuss techniques used to perform and delivery oral messages successfully. The PDF readings to supplement the lectures will be posted on the course web site in Canvas (<https://lss.at.ufl.edu/> - click on e-Learning in Canvas). Read the review-type articles and the book chapters for information and read the journal articles critically, following the guidelines on p. 8 of this syllabus for analyzing scientific articles.

From the October 9 until the end of the semester, students will present lectures on broad areas of insect resistance evolution and management and will lead critique and discussion of one or two scientific articles of their choosing that are related to their topic.

Class schedule and readings

Week	Class topic	Reading
1 – August 21, 2017	Elements of an effective oral presentation, selection of publications and schedule of the oral presentations	https://www.ted.com/talks/chris_anderson_teds_secret_to_great_public_speaking https://www.ted.com/talks/nancy_duarte_the_secret_structure_of_great_talks https://www.slideshare.net/slidemocomet/fix-your-really-bad-powerpoint-slidemocomet-based-on-an-ebook-by-sethgodin/43-SETHS_5_RULES_FOR_AMAZING http://www.pimpyourscience.org/lesson/8/How-to-deliver-an-amazing-scientific-talk.html https://www.ted.com/talks/amy_cuddy_your_body_language_shapes_who_you_are http://www.kumc.edu/SAH/OTEd/jradel/effective.html https://www.sfn.org/~media/.../baw_General_Techniques_for_Media_Interviews.aspx
2 – August 28, 2017	Introduction to insect resistance evolution	<p>Tabashnik BE, Mota-Sanchez D, Whalon ME, Hollingworth RM, Carrière Y.2014. Defining terms for proactive management of resistance to Bt crops and pesticides. J Econ Entomol., Apr;107(2):496-507.</p> <p>McKenzie, J.A. 1996. An evolutionary and ecological framework. Chapter 1. Academic Press, NY.</p>
3 – September 11, 2017	The resistance phenotype and resistance detection	<p>R4O Network, 2016. Trends and Challenges in Pesticide Resistance Detection. Trends in Plant Sciences. 21: http://dx.doi.org?10.1016/j.tplants.2016.06.006</p> <p>Kwon, D.H. T. Kan, Y.H. Kim, S.H. Lee. Pehotypic- and genotypic-resistance detection for adaptive resistance management in <i>Tetranychus urticae</i> Koch. Plos One. https://doi.org/10.1371/journal.pone.0139934</p>
4 – September 18, 2017	Resistance mechanisms	Complementary material to be provided
5 – September 25, 2017	Ecological and operational factors and considerations influencing insect resistance	Complementary material to be provided
6 – October 2, 2017	Guidelines when designing an IRM program	Onstad, D.W. 2014. IPM and Insect Resistance Management, chapter 16. In: Insect Resistance and Management: biology, economics and prediction. Elsevier, San Diego.
7 – October 9, 2017	Student presentation	
8 – October 16, 2017	Student presentation	
9 – October 23, 2017	Student presentation	

10 – October 30, 2017	Student presentation	
11 – November 6, 2017	Student presentation	
12 – November 13, 2017	Student presentation	
13 – November 20, 2017	Student presentation	
14 – November 27, 2017	Student presentation	
15 – December 4, 2017	Student presentation	
16 – December 11, 2017	Wrap up and final considerations	

Student Presentation Topics

Students will begin presentations on October 9, 2017. We will have one student presentation per week. Students should select from one of the following topics listed below. We have chosen these topics because they are broad enough to challenge your information gathering and synthesizing abilities. The topics are also very active areas of research right now so please use recent research papers as examples in your presentation. First come, first served! If you find that there are absolutely no topics in our list that interest you, you may choose another broad topic, in consultation with us.

Assign your fellow students one review-type article on the subject if you can find one, and one or two journal articles that you want them to read critically and discuss with you after the presentation, following the guidelines on p. 8.

1. Resistance inheritance and methods for determination
2. Resistance to plant allelochemicals and implications to insecticide resistance evolution
3. Resistance among disease vectors
4. Resistance among urban pests
5. Resistance and gene amplification
6. Metabolic resistance: P450
7. Metabolic resistance: Esterases
8. Target site resistance: Acetylcholinesterase
9. TSI: Kdr
10. Resistance Management: Multiple Attack
11. IRM: Management by Moderation
12. IRM in Developing countries
13. Resistance Monitoring
14. Fitness costs of resistance
15. Ecology and behavior factors influencing insect resistance
16. IRM and IPM

Prerequisites: None

Textbook: None

Assignments and Methods by which the Student will be Evaluated and Grades Determined:

- Provide with two weeks in advance one review-type article or book chapter, if possible, and one or two journal articles for classmates; facilitate discussion of at least 10-15 min after the presentation (15 points).
- Present a 35-40 minute seminar on a topic of interest chosen from the list above. Grades will be assigned based on the grading rubric on p. 9. Instructor evaluation of presentation (50 points); peer evaluation of presentation (10 points).
- Attendance is mandatory at all class periods; every student should read the assigned journal articles critically and come prepared to discuss them (25 points).

Grading: This course will be graded 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

Critical Dates for Exams or Other Work: Student presentations will begin on October 9. We will draw numbers to determine presentation order. After the drawing, you may switch dates with another student if you wish, but let us know.

Policy Related to Class Attendance: Attendance is mandatory and every class is critical. It is also considerate to attend the presentations of fellow students. Additional information about class attendance at UF can be found at:

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

Policy Related to Make-Up Exams or Other Work: Missed presentations cannot be made up except in the case of prior excused absence or family or medical emergencies. More information can be found at:

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

Class Demeanor Expected by Instructors: Please be considerate of your classmates by not chatting or texting during class. The banging of doors is very distracting to both students and professor, therefore please arrive on time and do not leave early. Turn off cell phones before coming into classroom.

Additional General Information: The following information applies to all courses at the University of Florida.

We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standard of honesty and integrity.

Academic Honesty: As a result of completing the registration form at the University of Florida, every student has signed the following statement: "I understand that the University of Florida expects its students to be honest in all their academic work. I agree to adhere to this commitment to academic honesty and understand that my failure to comply with this commitment may result in disciplinary action up to and including expulsion from the University."

Copyrighted Materials and Software Use: All students are required and expected to obey the laws and legal agreements governing copyrighted material and 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.

Accommodations for Students with Disabilities: Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation.

University Counseling Services: Resources are available on-campus for students having personal problems or lacking clear career and academic goals which interfere with their academic performance. These resources include:

1. University Counseling Center, 301 Peabody Hall, 392-1575, personal and career counseling;
2. Student Mental Health, Student Health Care Center, 392-1171, personal counseling;
3. Sexual Assault Recovery Services (SARS), Student Health Care Center, 392-1161, sexual counseling;
and
4. Career Resource Center, Reitz Union, 392-1601, career development assistance and counseling.

Critical Reading of Scientific Articles

Whenever you read a 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 and chapter books, think about these questions. We will use the answers to these questions as a starting point for our discussion of the assigned paper(s).

So, please come to class with the answers to these questions in your head or on a piece of paper and be prepared to talk about them.

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?

Evaluation of Oral Presentations in Insect Resistance Management to Insecticides

Student name _____

Title _____

Presentation components	Grade 1.....10 poor....excellent	Comments
Content (40%) - interesting subject matter; significance well established; informative introduction; well developed body of the presentation; strong ending and conclusions; 35-40 minutes		
Organization (20%) - no redundancy; logical and smooth transitions and flow		
Delivery (20%) - good eye contact; relaxed manner; appropriate pace of speech and use of pauses; effective use of pointer		
Visual aids (10%) - visually-pleasing slides (helpful, not distracting); good use of photos or diagrams as appropriate; well organized slide layout; font adequate size; well proofed		
Handling questions (10%) – repeat question; polite, concise and friendly response; seemingly at ease		