COURSE SYLLABUS
INSECT TOXICOLOGY (ENY 6651)

Credits: 3
Lecture: Wednesday and Friday 6th period (12:50-1:40 PM), room ENY 3118
Laboratory: Mondays 6th-8th period (12:50-3:50 PM), location ENY 2218 or alternate

Instructor

Dr. Jeff Bloomquist
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Course Objectives

To introduce the student to concepts associated with the toxicology, chemistry and formulation, modes of action, metabolism, resistance to, and environmental fate of insecticides. Specifically, to be able to interpret and use the IRAC mode of action poster for use in managing insecticide resistance in the field (http://www.irac-online.org/documents/general-moa-poster/?ext=pdf).

Prerequisites

This course is directed toward Entomology, Nematology, Doctor of Plant Medicine, or other interested students. There are no formal prerequisites, although a basic understanding of organic chemistry, insect physiology, and pest management is assumed.

Approach

Emphasis will be placed on basic and applied aspects of insect control with insecticides. The lecture portion of the course will be used to introduce and overview key concepts. The laboratory portion of the course will complement the lecture portion and provide hands-on experience with insecticide toxicity testing, as well as insecticide biochemistry and physiology.

Office Hours

I can be reached at work via email or phone during normal business hours. However, I maintain a busy schedule and travel frequently, and therefore may not always able to respond the same day you try to contact me. Please understand this and be patient. I will be available at designated "real-time" appointments. Please use email as the PRIMARY means of contact for the instructor during business and non-business hours.

Textbook and Readings

No textbook is required. However, S. Yu, *The Toxicology and Biochemistry of Insecticides*, 2nd Ed., CRC, Boca Raton, 2014, is recommended for additional reading and as a reference. However, if there is a conflict between class notes and the book, go with the class notes, or ask the instructor!

An electronic course packet will be provided by the instructor.

How to Succeed in this Course

Lecture: Grades for the lecture portion of the course are entirely dependent upon exam scores. Regular reading of lecture material as provided, along with regular lecture attendance, will provide the student adequate exposure to the course material. Please utilize the Instructor or teaching assistants as resources for answering any questions on the labs or lecture material. Finally, review sessions in which study questions and other lecture topics are discussed will be held the lecture or lab period prior to the exam. You are strongly encouraged to attend. All exams will be held during the lab period (see below).

Laboratory: Grades for the laboratory course are dependent on a written laboratory report and oral presentation of the project undertaken. Preparing in advance for laboratory time, understanding of concepts and experimental performance, as well as effective report writing and oral communication are all components of success in the laboratory portion of the course. *Unexcused skipping of lab sessions will result in a grade penalty.*

Grading

Lecture 75% (3 exams; each exam = 25% of final grade, and includes questions on matched lab
material covered during that period of the course, if appropriate)
Laboratory 25%
   Laboratory written report in required format, same as a research paper: Introduction,
      Materials and Methods, Results and Discussion (no more than 6 pages, single spaced,
      excluding figures). Longer reports will not garner extracredit.
   Laboratory oral report (10 min $\pm$ 1 min for slides and 5 min of class discussion), evaluated
      for clarity and organization of the presentation, time management, data analysis, and
      conclusions. Talks that go over the 10 min limit, will incur a grade penalty.

Unexcused absences can result in grade penalties.

Letter grades in this course will be determined in the following manner:
Grading scale:

A = 90-100%
B = 80-89%
C = 70-79%
D = 60-69%
E = 59% and below

NOTE: Grades will not be given out over the telephone or by email.

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

All exam questions are essay-type questions. *On the first exam there will be a question on formulating a dilution series where you will be required to show your mathematical work, because this is an essential skill in performing toxicity bioassays.*

LECTURE OUTLINE

Lecture No.	Topic
1	Introduction, definitions, and history of toxicology
2	Bioassay methods in toxicology
3	Pharmacokinetics
4	Review of Organic and Biochemistry
5	Mixed function oxidase metabolism
6	Esterases, GSTs, and secondary metabolism (biosynthetic)
7	Synergists and joint action of compounds
8	Introduction to the nervous system
9-10	Compounds acting on chloride channels: chemistry, properties, toxicity to insects and mammals, mode of action, metabolism
11-12	Organophosphorus insecticides: chemistry, properties, toxicity to insects and mammals, mode of action, metabolism
13	Carbamate insecticides: chemistry, properties, toxicity to insects and mammals, mode of action, metabolism
14	Nicotine and other cholinomimetics
15-17	DDT/pyrethroids: chemistry, properties, toxicity to insects and mammals, mode of action, metabolism
18	Other botanicals and synthetics affecting ion channels
19	Insecticides/miticides targeting energy and lipid metabolism
20	Amidine insecticides and miscellaneous acaricides
21	Miscellaneous insect control compounds: inorganics, repellants, attractants, antifeedants, and fumigants.
22	Insect growth regulators
23	*Bacillus thuringiensis* and baculovirus biopesticides
24-25	Insecticide resistance: development, mechanisms of resistance, cross resistance

LABORATORY EXERCISES/EXAM DATES

Lab. No.	Topic
1	Introduction and Selection of Projects
2	Selection of Projects
3	Projects
4	Projects
5	**Lecture Exam 1 (lectures 1-9)**
6	Projects
7	Projects
8	Projects
9	**Lecture Exam 2 (lectures 10-17)**
10	Projects
11	Projects
12	Projects
13	**Final Reports and Oral Presentations**
Finals Week	**Lecture Exam 3 (lectures 18-25)**

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 via the Disability Resource Center: www.dso.ufl.edu/drc/   001 Reid Hall, PO Box 114085, 1316 Museum Rd, 352-392-8565

Statement for Distance Courses
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.