Insect Molecular Genetics, ENY 5820

Instructor
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Department of Entomology and Nematology
Telephone: 352-273-3961  Fax: 352-392-0190
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Office hours are by appointment. Emails with queries are always welcomed, as well.

Course Goals

You will learn the basic terms and concepts associated with molecular genetics and genetic analyses of insects. Molecular-genetic methods can be used to solve problems in entomology involving sex determination, insect behavior, systematics, ecology, and genetic modification of pest and beneficial insects. The course will enable you to identify literature for additional study of specific topics. The text used is the Third Edition of *Insect Molecular Genetics* by M. A. Hoy (2013).

General Description

The course emphasizes the fundamental concepts behind several molecular methods, such as the polymerase chain reaction (PCR), cloning, sequencing, genomic libraries, microarrays and Southern and Northern blots, to answer questions of interest to entomologists. The course is split into three components and is intended to provide people with little previous experience in molecular genetics with an introduction to concepts, terminology, and applications of these powerful tools.

Part I. Review of basic information on DNA, RNAs, replication, transcription, translation, overview of genetic principles and terminology and overview of insect genome organization. The role of microbial symbionts in the biology of arthropods is emphasized, as well.

Part II. Overview of major molecular-genetic techniques, emphasizing principles, including use of restriction enzymes, cloning, genomic and cDNA libraries, DNA sequencing, genome sequencing, genetic modification of *Drosophila* using P-element mediated transformation methods, and other genetic modification techniques.

Part III. This section demonstrates the use of the diverse molecular genetic tools to understand sex determination and modification, behavior, ecology, systematics, and the application of genetic modification methods to manage pest insects. Regulatory and risk assessment issues surrounding the use of genetically modified insects also are discussed. The literature is reviewed and information provided for sources of additional information.
Credits and Format

3 credits. Assigned readings in the textbook, Powerpoint slides, and study questions are provided to aid the student.

Participation

Students are expected to read the assigned reading, and attempt to answer the study questions provided prior to attending class, with certain exceptions. Most classes will involve explaining unclear concepts or applications and discussion of the relevance of the molecular tools to specific research goals; thus, attending class without having read the chapters and answering the study questions will limit the value of most class sessions. Students are expected to attend all classes and take all examinations at the scheduled time. Cell phones should be turned off during class.

Grading Procedures

Two midterms: 25% each. Each examination may consist of definitions, short answers, and longer discussions of the tools and concepts of molecular genetics.

Final comprehensive examination (50%); about half will cover the material from the first two examinations and about half will cover the remaining material. For information on current UF policies for assigning grade points, see https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Exam Make-Up Policy

Examinations may be made up only with advance permission or an excuse from a doctor or the infirmary. Extenuating personal situations include a death or serious illness of an immediate family member. CALL PRIOR TO THE EXAMINATION. Leave a message on my telephone at: 352-273-3961 or email me at mahoy@ufl.edu.

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.

Course Grade Mean Total %

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<thead>
<tr>
<th>Score Range</th>
<th>Grade</th>
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<tr>
<td>95-100</td>
<td>A</td>
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<td>90-94</td>
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<td>87-89%</td>
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<td>83-86%</td>
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<td>80-82</td>
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<td>77-79%</td>
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<td>73-76%</td>
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Reading Assignments

The reading assignments include the third edition of *Insect Molecular Genetics*. Copies of this book will be placed in the Graduate Secretary's office in Gainesville. This text is not required, but is recommended. The book is available as an ebook or in hard copy from the publisher [http://store.elsevier.com/product.jsp?isbn=9780124158740&pagename=search](http://store.elsevier.com/product.jsp?isbn=9780124158740&pagename=search).

Student Accommodation

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. 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. 0001 Reid Hall, 352-392-8565, [www.dso.ufl.edu.drc/](http://www.dso.ufl.edu.drc/)

Campus Helping Resources

Students experiencing crises or personal problems that interfere with their general wellbeing are encouraged to utilize the university’s counseling resources. The Counseling and 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 that interfere with their academic performance. The University Counseling and Wellness Center is at 3199 Radio Road, 392-1575, [www.counseling.ufl.edu/cwc/Default.aspx](http://www.counseling.ufl.edu/cwc/Default.aspx)
The Career Resource Center is at First Floor JWRU, 392-1601, [www.crc.ufl.edu/](http://www.crc.ufl.edu/)

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, disciplinary action
will be taken as appropriate.

**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](http://www.dso.ufl.edu/SCCR/honorcodes/honorcode.php).

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Fall 2013
Insect Molecular Genetics, ENY 5820
3 credits, Monday, periods 6-8 (12:50 -3:50 pm)
Room 1027 ENY, Section 14A6 (for campus students)

Available via Polycom or True distance
REC and true distance students must register through Ruth Brumbaugh
(brumbaug@ufl.edu) to obtain a section number relevant to their site location.

Aug.  26 First class period; Please read Chapters 1 and 2* prior to class. I will
lecture on that day.

Sept.  2 University Holiday

  9 Chapter 3 Discussion

  16 Discuss Chapter 4; Review for Midterm 1

  23 MIDTERM 1 (Chapters 1-4); Discuss Chapter 5

  30 Discuss Chapters 6 and 7

Oct.   7 Discuss Chapter 8

  14 Discuss Chapter 9: Review for Midterm 2

  21 MIDTERM 2 (Chapters 5-9); Discuss Chapter 10

  28 Discuss Chapter 11

Nov.   4 Discuss Chapter 12

  11 University Holiday

  18 Discuss Chapter 13

  25 Discuss Chapter 14, Review for Final Examination

Dec.   2 COMPREHENSIVE FINAL EXAMINATION

* The recommended text for the class is Insect Molecular Genetics, 3rd Edition,
Academic Press, by M.A. Hoy. The bookstores in Gainesville should have copies and it
also is available from Amazon.com.