

## Insect Molecular Genetics, ENY 5820

### Instructor

Dr. Marjorie A. Hoy  
3111 Steinmetz Hall  
Department of Entomology and Nematology  
Telephone: 352-273-3961 Fax: 352-392-0190  
[mahoy@ufl.edu](mailto:mahoy@ufl.edu)

Office hours are by appointment. Emails with queries are always welcomed.

### 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 %**

95-100 A  
90-94 A-  
87-89% B+  
83-86% B  
80-82 B-  
77-79% C+  
73-76% C

70-72 C-  
67-69% D+  
63-66% D  
60-62 D-  
Below 60 E

### **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> and from the UF Library.

### **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>.

### **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.

### **Netiquette Guide for Online Courses (This course is available to Distance (REC students) and True Distance students)**

It is important to recognize that the online classroom is in fact a classroom, and certain behaviors are expected when you communicate with both your peers and your instructors. These guidelines for online behavior and interaction are known as netiquette.

### **Security**

Remember that your password is the only thing protecting you from pranks or more serious harm.

- Don't share your password with anyone
- Change your password if you think someone else might know it

- Always logout when you are finished using the system

### **General Guidelines**

When communicating online, you should always:

- Treat instructor with respect, even in email or in any other online communication
- Always use your professors' proper title: Dr. or Prof., or if you in doubt use Mr. or Ms.
- Unless specifically invited, don't refer to them by first name.
- Use clear and concise language
- Remember that all college level communication should have correct spelling and grammar
- Avoid slang terms such as "wassup?" and texting abbreviations such as "u" instead of "you"
- Use standard fonts such as Times New Roman and use a size 12 or 14 pt. font
- Avoid using the caps lock feature AS IT CAN BE INTERPRETTED AS YELLING
- Limit and possibly avoid the use of emoticons like :) or ☺
- Be cautious when using humor or sarcasm as tone is sometimes lost in an email or discussion post and your message might be taken seriously or offensive
- Be careful with personal information (both yours and other's)
- Do not send confidential patient information via e-mail

### **Email Netiquette**

When you send an email to your instructor, teaching assistant, or classmates, you should:

- Use a descriptive subject line
- Be brief
- Avoid attachments unless you are sure your recipients can open them
- Avoid HTML in favor of plain text
- Sign your message with your name and return e-mail address
- Think before you send the e-mail to more than one person. Does everyone really need to see your message?
- Be sure you REALLY want everyone to receive your response when you click, "reply all"
- Be sure that the message author intended for the information to be passed along before you click the "forward" button

### **Message Board Netiquette and Guidelines**

When posting on the Discussion Board in your online class, you should:

- Make posts that are on topic and within the scope of the course material
- Take your posts seriously and review and edit your posts before sending
- Be as brief as possible while still making a thorough comment

- Always give proper credit when referencing or quoting another source
- Be sure to read all messages in a thread before replying
- Don't repeat someone else's post without adding something of your own to it
- Avoid short, generic replies such as, "I agree." You should include why you agree or add to the previous point
- Always be respectful of others' opinions even when they differ from your own
- When you disagree with someone, you should express your differing opinion in a respectful, non-critical way
- Do not make personal or insulting remarks
- Be open-minded

**Fall 2014**  
**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**  
**(brumbaugh@ufl.edu) to obtain a section number relevant to their site location.**

- Aug. 25 First class period; Please read Chapters 1 and 2\* prior to class. I will lecture on that day.
- Sept. 1 University Holiday
- 8 Chapter 3 Discussion
- 15 Discuss Chapter 4; Review for Midterm 1
- 22 MIDTERM 1** (Chapters 1-4); Discuss Chapter 5
- 29 Discuss Chapters 6 and 7
- Oct. 6 Discuss Chapter 8
- 13 Discuss Chapter 9: Review for Midterm 2
- 20 MIDTERM 2** (Chapters 5-9); Discuss Chapter 10
- 27 Discuss Chapter 11
- Nov. 3 Discuss Chapter 12
- 10 Discuss Chapter 13
- 17 No Class: Entomological Society of America meeting
- 24 Discuss Chapter 14
- Dec. 1 Review for Final exam
- 8 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.