

Insect Classification (ENY 4161 / ENY 6166), Spring 2013

W 9:35-12:35, F 9:35-11:30, Room 3118

(days, times or location of class may change)

Instructor: Dr. Marc Branham
Room 2005, Entomology-Nematology Building
Office hours: Monday 2:00-4:00pm, or by appointment
Voice mail: (352) 273-3915
e-mail: marcbran@ufl.edu

The goal of this course is to provide you with a sound theoretical and practical understanding of both insect diversity and the practice of classifying organisms. The lectures will discuss the general principles of systematics, history of insect classification, construction and use of identification tools, nomenclature, and the biology and evolutionary history of the orders of hexapods. The laboratory work will focus on the means of recognition of the major groups of insects (to order and family) as well as in class exercises applying the concepts discussed in lecture. A collection is required that will further refine your ability to identify insects to the level of order, family and in many cases the level of species. Accumulating the required numbers of taxa will be possible only by employing a variety of collecting techniques. Building an insect collection, with correctly identified specimens is an excellent way to learn, understand and employ the methods used by professionals to classify not only insects, but animals in general.

Although this course does not concentrate on systematic theory, some attempt is made to explain why competing classifications exist in insect taxonomy, and what existing classifications imply about broad patterns of evolutionary change and diversification within insects.

Course Prerequisites:

ENY 3005, Principles of Entomology, or a similar course dealing with the classification of insects.

REQUIRED Text:

Triplehorn, C.A., and N.F. Johnson. 2005. Borror and DeLong's Introduction to the Study of Insects, 7th edition. Thomson Brooks/Cole, Blemont, CA.

Additional Recommended Resource:

Borror, D.J., and R.E. White. 1970. Insects of America North of Mexico. Peterson Field Guide Series 19. Houghton Mifflin Co., Boston, MA.

Final Grading Scale (percentage):

94-100	A		73-75	C
90-93	A-		70-72	C-
86-89	B+		66-69	D+
83-85	B		63-65	D
80-82	B-		60-62	D-
76-79	C+		≤ 59	E

For further information about the current UF Grading Policies for assigning grade points, go to <http://www.registrar.ufl.edu/catalog/policies/regulationgrades.html>.

Grading Criteria:**Undergraduate**

Midterm Exam	18%
Final Exam.....	18%
Lab exercises and quizzes	20%
Collection.....	34%
Class participation (collecting, discussions, etc.).....	10%

Graduate

Midterm Exam	15%
Final Exam.....	15%
Lab exercises and quizzes	17%
Collection.....	30%
Library Project (Literature Review).....	17%
Class participation (collecting, discussions, etc.).....	6%

Course Schedule: (dates may change)

Week	Session	Topic
1. Jan 5, 7	Lecture	Collection methods and review of insect morphology (grasshopper)
	Lab	Study morphology (fly, moth, bee)
2. Jan 12, 14	Lecture	Taxonomy, systematics and classification; Homology
	Lab	Insect pinning and curation, sign-out collection equipment
3. Jan 19, 21	Lecture	Principles of Classification
	Lab	Major lineages of insects
4. Jan 26, 28	Lecture	Tools for identification - Keys and their use; packing insect specimens for shipment
	Lab	Entognathous hexapods and minor insect Orders
5. Feb 2, 4	Lecture	Ephemeroptera and Odonata; Major lineages of neoptera
	Lab	Orthopteroid Orders
6. Feb 9, 11	Lecture	Collecting Field Trip
	Lab	Neuropteroids and Paraneoptera Lecture
7. Feb 16, 18	Lecture	Mini Collection due (Feb. 16), Review for Midterm
	Lab	Midterm (Feb 18, Room 3118) (no lecture)
8. Feb 23, 25	Lecture	Hemiptera
	Lab	A History of Insect Classification
9. Mar 2, 4	Lecture	Coleoptera
	Lab	Species concepts and descriptions
10. Mar 9, 11	<i>SPRING BREAK</i>	<i>SPRING BREAK</i> (March 9-13) (a good time to nab more insects)
11. Mar 16, 18	Lecture	Zoological nomenclature
	Lab	Diptera
12. Mar 23, 25	Lecture	FIELD TRIP - FL State Collection of Arthropods
	Lab	Lepidoptera
13. Mar 30, Apr 1	Lecture	Open lab time and collecting
	Lab	Hymenoptera
14. Apr 6, 8	Lecture	Guest Lecture
	Lab	Open lab time
15. Apr 13, 15	Lecture	Collection due (April 13); Review for Practical Exam
	Lab	Practical Section of Final Exam - (Apr 15, Room 3118)

16. Apr 20	Open Class	Review for Final Exam
Apr 22	<u>NO CLASSES</u>	READING DAYS (April 21-22)
17. Apr 27	Final Exam Room 1031	Final Written Exam, (12:30-2:30pm Room 1031) Graduate Literature Review due

Lecture Exams:

Lecture exams will be written and composed of at least one (if not more) of the following type questions: multiple choice, short answer, fill in the blank or essay. The final lecture exam is not cumulative.

Laboratory Exercises and Quizzes:

The laboratory exercises and quizzes will only cover material presented in lecture or lab from the two most recent class periods. No quizzes can be made up without prior approval, but the lowest quiz score will be dropped. Exercises will generally focus on the students applying concepts recently presented, either individually or in a group setting.

Mini collection:

On February 16, your mini collection will be due at the beginning of class (9:35 am). This is my way of making sure that you don't leave all of your collecting till the end of the course. On the 16th, you should plan on turning in specimens representing at least 8 orders that are correctly pinned, labeled and identified. In addition to your pinned insects (which are to be identified and properly labeled) please also include at least one point mounted specimen and at least one specimen in a vial containing alcohol (EtOH). A "Collection Contents List" is also required with the Mini Collection (see requirements for main collection for details of how to format this.) As with your major collection requirement, please arrange the specimens phylogenetically (i.e., in the order found in Triplehorn and Johnson).

Collection:

The collection requirement for (undergraduate students) is 18 Orders, 100 families and 15 species identifications; for (graduate students) it is 22 Orders, 120 families and 20 specimens determined to species.

Each collection is to be accompanied with a citation list of those materials used to make species determinations. If I cannot find a work listed in your list of citations, I will be suspicious of your determination and will investigate further. I suspect that most of the references you use for making species determinations will be books and scientific journals. If you use references from the www, you need to also include with your List of Citations a printed copy of the information available on the websites cited (in addition to citing the website, which should include its URL).

Each correctly identified **order** is worth 2 points; each correctly identified **family** and **species** determination (genus and species) is worth 1 point – points will be awarded for each taxon only once. The remaining 25 points will be based upon the curatorial quality of the specimens (i.e., properly mounted and labeled). No credit will be given for specimens that are in such bad shape that we cannot identify them!

I will award +2pts extra credit for each additional (correctly identified) insect Order included in the collection that is above the Order requirement specified above.

If the collection (and its components) are turned in after (10 am) April 13, 30 pts. per day will be deducted from the collection grade (beyond 10 am on April 13th.)

Collection Requirements:

- 1) In addition to a locality label, each specimen is to contain an identification label indicating to which Order and Family it belongs. For the specimens that are determined to species, the genus

and species are to be placed on the identification label with the order and family names (see template example), and the borders of these labels (bearing specie names) are to be colored green. The green borders will aid us in finding the species determinations while grading your collection.

- 2) All specimens belonging to each insect Order are to be grouped together under a separate “header label” (containing the name of the Order). This header label should be pinned to the bottom of the insect box. Insects that are correctly identified to Order (via the ID label on the same pin as the specimen) but are not placed under the correct “Order header label” will result in 2 points being subtracted from the overall score given to the collection.
- 3) With the insect collection, each student is required to turn in a “Collection Contents List.” This list should list how many specimens are present in the collection for every family. In addition, families need to be grouped within the Order they appear in the collection. **If no “Collection Contents List” is turned in with the collection, the collection will not be graded and a score of zero will be entered for the collection requirement.**

Ex. COLEOPTERA

Carabidae – 4 specimens
Dytiscidae – 1
Haliplidae – 1
Cantharidae – 4

LEPIDOPTERA

Nymphalidae – 3 specimens
Geometridae – 1
Danaidae – 1
Saturniidae – 2

Note: The spelling of the names on the “Collection Content List” will be important – use care and be accurate.

- 4) Specimens should be both listed on the “Collection Content List” and placed in the Collection, in the order in which they appear in “Triplehorn and Johnson, 2005” as applies to Order only. Ex. from Protura to Hymenoptera. This is ensure that your collection is organized from the most basal (primitive) to the most advanced (derived) taxa. This will allow you see a progression of morphological specialization across Insecta and will aid us in locating certain insect taxa when grading your collection.
- 5) **The insect collection, “collection contents list” and “list of citations used for species determinations” are all due at the beginning of the period on April 13 (i.e., 9:35 am, Friday, April 13) . [If no list, collection grade = 0.]**

Conditions Concerning Specimens to Be Used In Fulfillment of the Insect Collection Requirement:

- 1) **Specimens that were used for the collection requirement of another course must not be included in the collection required for this course. (Specimens turned in from this category will result in a collection grade of zero.)**

- 2) Specimens to be used for the insect collection requirement must have either been collected by the student turning in the collection, or specimens collected by a classmate who is currently enrolled in ENY 4116, 6166.
- 3) Specimens collected by a classmate that were subsequently traded or given to another classmate ("classmate" constitutes another student enrolled in the same section of this course, e.g., in the Gainesville campus course and same semester) and used in their collection must bear a label which indicates who collected the insect.
- 4) All identifications of specimens are to be made by the owner of the collection. These identifications include those made for material acquired through trading with classmates.
- 5) Rules concerning "Academic Misconduct" apply to all specimens and specimen labels submitted (turned in) for the insect collection requirement of this course. A violation of these rules could result in dismissal from the University.

Field Trips:

During the course of the semester we will go to a variety of habitats to maximize your exposure to immature insects. By doing so, it also maximizes the risk of coming across something that could harm you. Ticks, chiggers, widow spiders, mosquitoes, biting flies, reptiles, plants and other environmental hazards will be encountered during these trips, so dress accordingly. Appropriate dress includes shoes, long pants, long sleeve shirt and a hat. Although this recommendation does not completely eliminate the risks associated with outdoor activity, it does reduce it considerably. A change of clothes is a good idea if you are one that doesn't mind getting into your work. Insect/tick repellent and sunscreen may also be necessary for these trips along with snacks and water.

The week of February 9th, the class will have a required collecting trip to a location around Gainesville. We will meet in our classroom at the normal class time (see schedule) and will take Entomology Department vans to a suitable collection site for the duration of the class period (perhaps longer if everyone can stay.)

Library Project -Literature Review (required for the graduate students):

The goal of the library project is to conduct a review of the published literature on a taxon of your choice. The taxon should be one of the smaller insect Orders or a major subgroup of one of the megadiverse Orders (Coleoptera, Diptera, Hymenoptera, or Lepidoptera). *Your choice of a taxonomic group must be made and approved by the instructor by **March 2***. The literature review should begin where your textbook leaves off, i.e., approximately 2005. You should summarize findings on family-level (or higher) systematics, classification, keys, and fossils. Please include a synopsis of the current classification and a bibliography of important works. Do not depend solely on resources available on the Internet - I expect you to use the library as well. This literature review will be due **at the beginning of the final exam period (12:30 am, April 27)**.

Attendance:

Students are responsible for all material distributed in and/or discussed in class. In the case of skipped classes, students are advised to obtain lecture notes and handouts from classmates unless there is a legitimate excuse, in which case I will be happy to help. Make-ups are not given except under circumstances of excused absence. Letting me know of a conflict or problem ahead of time may be all it takes to reach an arrangement.

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."

Computer use: An entomology computer lab, located across the hall from the lecture room in the Entomology and Nematology building, is open to students in this course from the hours of 8 AM to 5 PM. Access at other times can be arranged. This lab is run by Steve Lasley, so all problems and questions concerning the lab should be addressed to him. Steve's office is located in the Entomology & Nematology building in room 1012.

Copyrighted Materials and Software Use: All faculty, staff and students of the University 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 that 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 assault counseling;
4. Career Resource Center, Reitz Union, 392-1601, career development assistance and counseling. sexual assault counseling.