WELCOME TO ENY 3005L/5006L

PRINCIPLES OF ENTOMOLOGY and GRADUATE SURVEY OF ENTOMOLOGY LAB

Summer

Online

INSTRUCTOR:

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LAB TEACHING ASSISTANTS:

(*please e-mail TA with questions and copy Dr. Baldwin)*

Alex Bauer: bauer.a@ufl.edu

Office hours/open labs by Zoom on Friday from 2:00-4:00 (EST).

Link is under Zoom Conferences on the **lecture** page of Canvas.

Overview

This class provides the laboratory activities for the ENY 3005/5006 online course. ENY3005/5006 and ENY 3005L/5006L are co-requisites and should be taken in the same semester. In this lab, you will learn the anatomy of an insect, how to identify an insect to order, how to collect and curate insects, and you will learn a bit about how insects fit into our lives. Entomology laboratories are generally a time to form relationships as you collect and curate your insects. In an online environment, it will be up to you to foster relationships and organize insect collecting trips in your location. To foster making connections, there will be a meet and greet zoom time early in the semester.

Learning Objectives

1. Recognize the diversity of insects and their adaptations.
2. Design and use dichotomous keys to identify insects to order.
3. Experiment and communicate results using the process of science.
4. Explore habitats and relate associate arthropod diversity to the habitat.
5. Construct a properly curated diverse insect collection including appropriate locality data, identification, and curation.
6. Analyze case studies and formulate reports based on provided data.

There are a series of lab activities for you to complete during the semester. Some of the assignments are interactive, virtual labs, and some are hands-on labs that require a lab report, and some are lectures and interactions that build a foundation for your capstone project of an insect collection.

The first few labs will give you a foundation that will help you learn to identify insects so you can begin working on your collection. Your insect collection will be the final project of the semester, so will demonstrate the skills you have learned as we progress through the material. As you learn to observe, document, research, collect, identify and curate, you will find that you gain many skills that will help you in your chosen field. Attention to detail, documentation of data and diagnostic skills are proficiencies you can express when you are interviewed for graduate school, professional school or for employment. You will notice that there is a lab report (pest management) where you write through the scientific

process and analyze the data you collect during the experiment you perform at home. This is an experiential learning assignment. The experiment will take time to set up and will take a while to collect the data, **so be sure to read it ahead of time.** Besides the insect collection and lab report, there will be a lab exam at the end of the semester and several worksheets submitted as graded assignments.

The lab material can be found in Canvas at elearning.ufl.edu. **Assignment submissions should be posted to the assignment link in Canvas.** *Please follow the "Complete by" date on this syllabus and in Canvas.* Refer to the course outline for assignment due dates. Generally, lab assignments are due by 11:59PM on Wednesday, so there is spacing between lecture and lab due dates (most lecture assignments are due on Sunday and quizzes and exams are on Friday). If you have questions about assignments, please e-mail the TA through Canvas and copy the instructor. **The TA will be your primary contact for the lab portion of the class**. If you are having difficulty with a particular lab, be sure to reach out during the week so we can provide you some guidance. Please include ENY3005L or ENY5006L in the subject line, and we will try to respond in 48 hours on weekdays.

Where to start:

There is much detail to cover, so please read this so you have an understanding of the importance of the insect collection and how to ship it for evaluation.

During the first week of class, you will need to review this syllabus and take a syllabus quiz. You will need to score 100% to receive credit, so you need to be sure to review all the details and take the quiz until you can answer all the questions correctly. (Be sure to answer the questions as asked. If it asks for a numeral, you should type the word for the number.)

You will want to begin your insect collection **as soon as possible** since you want the best weather to collect your specimens. During the first week, you should read the "Collection and Curation" information in Canvas. This explains the materials you will need for the required insect collection as well as the different collecting and curating techniques. You will likely come back and review this lab as you begin to curate and label your specimens but knowing what is ahead of you will motivate you to start work on the collection early in the semester.

What is Lab 0?

The Collection and Curation lab is labeled as Lab 0 since it is a foundation for your final insect collection (Lab Project). You want to collect at different times, in different weather conditions, in different habitats and in different locations, so you don't want to wait to get started collecting. Labs 1 and 2 (External and Internal Morphology) contain very important information that will help you with your collection, so please make sure that you these get done on time so you can correctly identify and curate the insects you are collecting. You'll notice that the second half of your textbook contains keys to insect orders and families. During the third lab, you will learn how to use those keys to discover what insects you have collected. If you purchased the Photographic Atlas of Entomology, remember that those keys are outdated, so you will need to write in the newer information from the class/textbook. You will need the newer taxonomy for your insect collection labels. For example, Homoptera is no longer an order. Heteroptera, Hemiptera, and Heteroptera are all combined under one order, Hemiptera, so only Hemiptera will count towards an order for your collection. Isoptera and Blattodea are now combined into Blattodea.

Insect Collection, Insect Collecting and Shipping your Collection

Although the first two labs prepare you with information about insects, you do not have to wait to begin collecting. Also, having actual specimens to examine will provide you with examples as you learn the insect orders during Unit 3 of lecture material. If you do collect insects before getting your insect collecting kit, please put them in baggies or container with the dates and place of collection, then store in your freezer until you are ready to pin them. They should be frozen as soon as you collect them. Once they have dried out, it is difficult to curate them without damaging the specimen. Your collection will be ongoing throughout the semester, so you begin with Lab 0 and progress until the collection is due. There is a check-in along the way where you will submit photos of your mini-collection so you can receive feedback on your pinning and labeling technique. We also can see what diversity of insect orders you are collecting. It also gives you an idea of how much time it takes to prepare specimens properly. You are welcome to

arrange the appendages and spread wings, but the only required spreading will be for all of your moths and butterflies (Order Lepidoptera). There are no scheduled weeks for collection trips, so you are expected to collect when you can. If you have any problems or need suggestions, please contact the TA and instructor. We will have Zoom office hours each week.

***Note: Students in the REC (UF Research and Education Center) or ALAB (Gainesville) sections will be required to include a photo of the student holding their mini-collection in an identifiable location on campus (near a campus sign) and include that photo with the mini-collection photos. Also, at least 25% of your specimens should be collected on campus and contain a locality label indicating when and where the specimen was collected. This requirement is to fulfill a UF requirement for online students in these sections.**

Since this is an online course, there are students across the US and even in other countries. Take into account the weather conditions in your area and plan to collect on warm, sunny days. Also, feel free to set up collection trips and invite others from the class. You never know, someone may be close enough to attend (The UF Entomology Club will also have collecting trips.). Oh, while we are on that subject, if someone collects a specimen for you, please add their name as the collector at the end of the locality label. <u>You can trade up to 10% of your specimens with others in the class, but the other 90% must be collected by you or when you were on a collecting trip with others.</u> Purchased collections/specimens are not allowed nor or specimens that have been in colonies from pet stores or labs (more details below). **You may also not use specimens that have been previously graded for other classes, even ones not taken at UF**. If you have a question about an insect you collected before the semester began, please ask about it during office hours. If it has not been evaluated for a grade, you may use it as long as the locality label is correct. Do not change the original label.

Please don't wait until the last minute to collect. Curation takes some time, so you want to leave the last few weeks before the collection is due to work on labeling, pinning, and shipping. Keep in mind that **the label and index data is as important as the specimen**, so it must be accurate and complete. Each specimen must be identified to order, labeled, and properly curated. If you submit more than the minimum number of butterflies and moths, each specimen should be properly spread.

IMPORTANT: You will need to ship or deliver your insect collection for grading. With this being the case, you will only collect **adult** insects. Immature insects are curated in alcohol, so to avoid the difficulties in shipping liquids, you are to submit only adult insects. When properly curating, soft-bodied insects are preserved in alcohol. For this online class, you may pin, point or, in the case of non-insect arthropods, card-mount specimens. <u>You are not required to use alcohol vials.</u> For this class, you may pin or point all specimens. *Please pay attention to the wings/wing pads as immature insects won't have fully developed wings, so don't count as an adult insect*. You will learn the orders and metamorphic types, so don't want to miss out on points by mistakenly submitting immature insects. In the past few semesters, cockroaches, crickets and grasshoppers were the culprits as many submitted immature instead of adult specimens. There are exceptions, such as the Florida Woods Cockroach, but for most North American species of cockroaches, the adults have wings. The same is true for grasshoppers, crickets and katydids. With all of that said, if you are hand delivering your collection and wish to use alcohol vials for your soft-bodied insects (scales, thrips, silverfish, springtails), please get permission from the instructor or TA.

NOTE: Due to shipping issues, collections will <u>no longer</u> be returned to you. Please keep this in mind when you are submitting your collections. In the case that you are able to deliver and pick up your collection in person, you may indicate that on your index. Collections will only be available for pick-up for three weeks after grades are posted. After that time, they will be donated for educational programs. This is on online course taught with students in various locations, so to be equitable to everyone in the class, the guideline will be that collections will not be returned.

Donating your collection

Have you ever wondered what happens to the collections that are submitted for grading? Collections in good condition and properly curated will be donated for education events. Specimens that are graded may be marked so they can't be placed into other graded collections, but they are perfectly fine for teachers to use in the classroom. Who knows? You

may visit a school one day and see your insects in a teaching collection for 4-H, FFA, or biology classes. They may even be seen at a local library to promote books in the field of biological sciences or on display at a nature center in a park. Keep in mind that only properly curated and labeled specimens will be used for these purposes, so be sure you follow the proper techniques so others can benefit from your collection when the class has been completed.

Shipping Guidelines:

Be sure to take photos of your collection before you ship it in case there is some damage during the shipping process. Photos, as well as the completed index will be uploaded to Canvas prior to shipping the collection. Sometimes there is shipping damage, so the photos may be needed to verify a broken specimen.

This is going to sound like a lot of rules, but we want to avoid shipping disasters. Please understand that these guidelines are made from prior experiences, so we can avoid any issues with shipping. The carrier is your choice, but we prefer UPS or FedEx. Keep in mind that all previous shipping labels will need to be removed, so if you are using that nice box from your Amazon order, be sure to pull off or cover the labels, or the collection just may end up being delivered back to you.

You are welcome to hand-deliver your collection to Steinmetz Hall or to a UF REC where a TA is located. The TA will announce the available delivery dates and times. Collections must be delivered M-F from 8:00-5:00 to the front office of Steinmetz Hall, or during the designated times to the TA or Dr. Baldwin. There will also be a cart outside of Dr. Baldwin's office when she is in class during the collection drop off dates (Steinmetz 2208). If you are going to pick up your collection, please include a pick-up date on your index, or make arrangements with the TA or Dr. Baldwin.

Tip:
Also, be sure to take photos of your collection each week, so if something happens to your specimens, like ants invade, or your cat decides to munch on your prized specimen, you have documentation of the collection. Be sure to store your collection in a secure box and place it in a dry, secure location. Each collection must be submitted in a box where the lid can be removed to access the specimens.

Important note about illegal and dishonest Insect collecting:

*Note that it is illegal to collect plants or animals in **State and National Parks** without a permit. Specimens collected illegally will not receive credit, and you may receive a fine or other sanctions from the park service.*

*All insects must include accurate locality labels including the collector's name if the specimen was not collected by you personally. (Only 10% of your specimens may be traded between students currently in the class, and **no** specimens may be obtained from other sources.)*

National Forests (Legal Collecting):

Collecting in National Forests is **legal**, so many students collect in the Ocala National Forest. Do a browser search for National Forests in your state and see if you would like to organize a collecting trip. Collecting in a group is not only fun but provides some safety. Feel free to invite friends and family to go along with you. You will find that you are learning more as you teach identification and collecting techniques to others. You may also ask friends and family, with a yard, if they would set out steppingstones, or pieces of wood or lumber so you can go weekly to check under them for specimens. You can also ask if you can install pitfall traps made of plastic cups.

***Purchased insects are not allowed and will be reported as academic dishonesty**. Specimens that have ever been in a graded collection are not allowed, and specimens that come from a maintained colony are not allowed (UF, USDA, Pet store, etc.). Some collections/specimens are marked each semester as they are graded and specimens may NOT be recycled from past collections to be regraded. Nor may they be used in future collections (unless allowed on the syllabus).*

Collections submitted with any falsified label information, or marked, purchased, or illegally collected specimens will be marked as a zero, and the student will be referred to the Dean of Students Office for academic dishonesty. This could result in a failing grade and sanctions from the University of Florida. – ***Do not purchase your specimens!*** *(I have to keep collections from dishonest students for three years, so those are the types of collections I don't want to add to the collection cabinet. Don't be tempted to take shortcuts. Insects can be found in most habitats on Earth (not in the deep ocean), including cold environments, so take time to collect on warmer sunny days.*

Specimen Identification and Labeling

Each specimen must be pinned or spread properly (all leps) and must be in good condition. (Not necessarily perfect, but good. You can glue on a leg or antennae that gets broken.) **All specimens should be identified to order** and should be properly labeled. (For a label template, please see the link in Canvas. You'll need to enable macros in MS Word.). An index listing your specimens in phylogenetic order must accompany your collection.

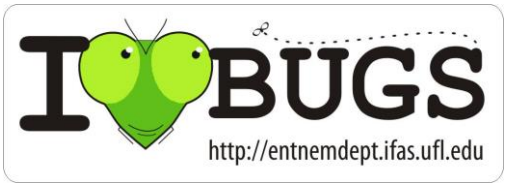
Graduate students should include the family names on the index as well. An example will be posted in the collection and curation lab. Be sure to neatly arrange the insects under the order label (photo examples follow).
Photos of your collections will be submitted to Canvas, and you will submit photos of your mini collection early in the semester for feedback. Photos of the entire collection are to be submitted to Canvas by the due date, and collections are to be delivered by mail or drop off by the due date. Late collections will be penalized 5 points for the first day and 10 points for each additional day. Please see the assignment in Canvas for additional details.

How should your collection look?

This may be understood, but you would be surprised at some of the creative ways students find to submit their insect collections. I am going to provide you with some resources to purchase insect collecting kits. Feel free to shop around and see what you can find but remember that the collection is to be submitted in a **sturdy box** of some type and must be professional in appearance. Collections submitted outside of a collection box (i.e on poster board, corkboard, or Styrofoam) will not be accepted. With that being said, please do not pin your insects to the box itself. You will need some **foam** to hold the insect pins in place. Yes, we have dug through packing peanuts deep into a box to find that the insects were pinned in the bottom of a box the size of a microwave. Technically, they were in a box, but they all had to be removed to be graded. (And we had many pin pricks because of it, and the insects were in pieces.). I share this story with you so you can think about your options.

Each collection should be presented in a professional manner (neat, orderly, clearly marked labels on each specimen, all Lepidopterans properly spread, specimens intact, etc.).

Unprofessional presentations will receive a zero grade. You are investing time in this collection, so you want it to represent your effort and your knowledge. This collection is worth 100 points and will take some time to complete. Generally speaking, insects have a short life-span, so you may choose to collect and feed insects until they die of natural causes before you curate them. This is possible if you begin your collecting early and give yourself time. Speaking of that, if you submit insects that are pinned but are still alive, you will receive a 10-point deduction in your grade for each specimen. You may use the freezer, ethyl acetate, or nail polish remover (acetone) to euthanize your specimens humanely. Larger insects may take more time in a fully charged kill jar, so consider using a freezer for large specimens. If an appendage gets broken, you may **carefully glue** it back in place. Simply place a drop of white school glue on paper in the refrigerator for a few minutes until it thickens. Use an insect pin head as a paint brush to apply glue to the areas that need to be fixed. Prop the repaired appendage with extra pins (support pins) until the glue has had a chance to dry.



The glue will dry clear. A specimen can still be submitted if there is minor damage, but feel free to glue broken legs or antennae back into place. You can also place a drop of glue near the pin to prevent slippage or spinning on the pin.

Brace pins should be used to support larger or longer specimens. If in doubt, please drop by our office hours on Zoom to ask questions or show off your specimens.

Collection Packaging Details Review

Insects can become damaged in shipping, so please take care when preparing them for shipment. Remember that you may have difficulty shipping alcohol vials, so may need to pin all specimens. If you have large specimens, please secure them with pins on the sides so they do not spin (brace pinning). Also, please put a piece of cardboard or poster board over your collection pins so the pins do not bounce loose during shipment (pins will become imbedded in foam, so you should avoid a foam top or foam core board).

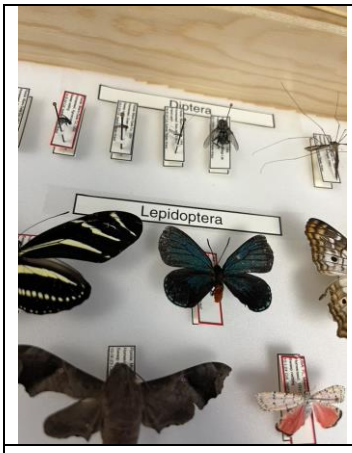
All pins should be pushed down in the bottom foam until they reach the bottom of the box, but do NOT press on the top cardboard or the pin heads will stick in the top and will be damaged when the box is opened. **Keep in mind that we have to open and grade the collections, so please do not tape all the way around the inner or outer box lid and also take care when using bubble wrap or other packing materials, that you allow your collection to be easily opened without damage.**

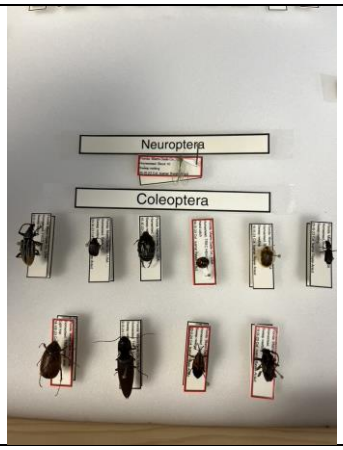
Test your box by gently rotating it vertically and side to side. If any insects move, be sure to secure them with support pins on the sides. You will be tempted to use vials for specimens but do not ship vials in the same area as the pinned insects. Vials can destroy your collection if they come loose in transit.

You may place the index on the top of the piece of cardboard you add to the top of the pins in the collection box. If you have vials, place them in a sealed bag and put them in this area where they can't damage the pinned specimens. If your box is too shallow for insect pins, you may need to clip the sharp tip of the, after curation, so they fit under the glass top. Please do not submit collections that can harm us when we unpack them for grading (i.e. pins sticking through the bottom of the box. Again, blood on your grading sheet is evidence of neglect in curating. Boxes designed for insect specimens are best. If you purchase a box from an art store, please ensure the pins fit, or clip the pins once you have pinned the specimen.)

Please arrange your specimens so that order labels can be seen above that taxonomic group. This makes the collection usable for educational purposes and reduces the likelihood of damage when we handle the specimens. Locality labels should be on **each** specimen pin and pin order labels can also be included on each pin. If you use larger order labels above that group of specimens, the locality label on the pin would be the **only** pin label required. If you elect not to include the large order labels over that section of insects, you would need both the locality and order label on each pin.

Note for ENY5006 Only:
For graduate students, please do include **order:family** labels under the locality labels with the specimens you select for family identification. You would use the third step on your pinning block for the order:family label. Please **also highlight the outside edge** of the label of the specimens you identify to family so we can identify which ones you have selected for family level identification. You can select any color and may use a pen or marker if you prefer.



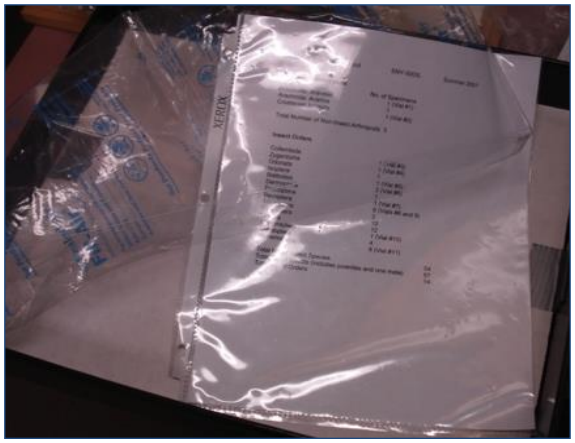
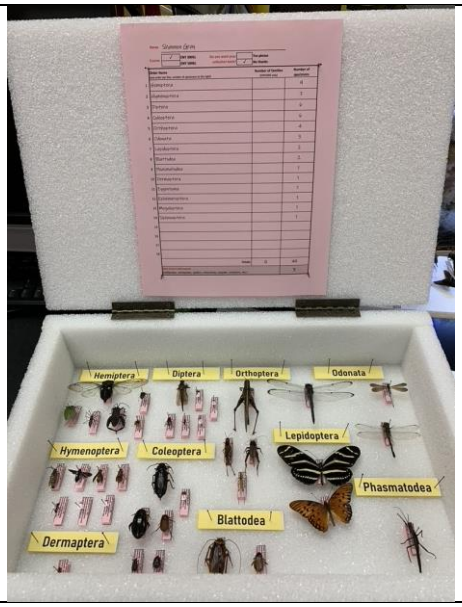
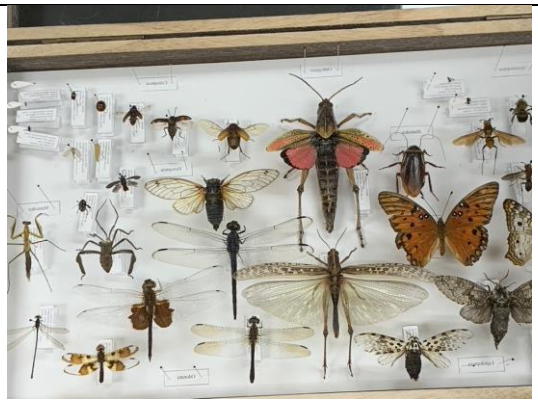


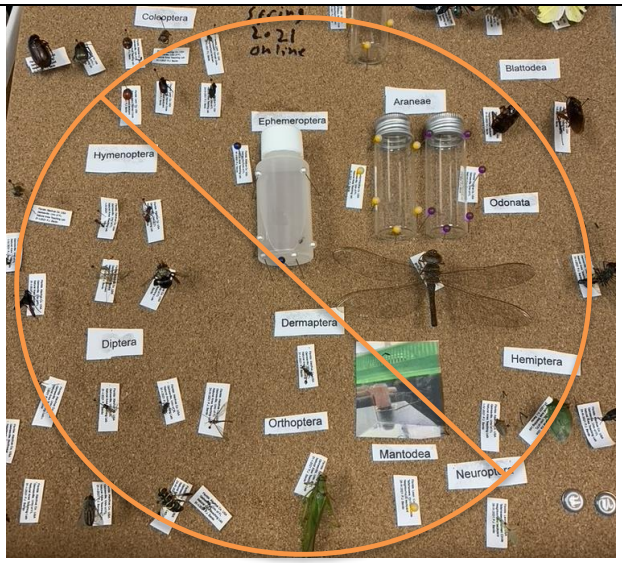
Note that the insect specimens identified to the family label have been highlighted.

Insect collection examples: Be sure your collection looks neat and professional.

Specimens are placed under the order label. Specimens should be arranged neatly.

Specimens are arranged neatly and extra pins (braces) are used to prevent movement in the box.

Group insects by order and be sure the pins are firmly in the foam base. Additional box supports have been added to provide stability for shipping and ensure the lid does not drop onto the pins.	If vials are sent in a collection, they should be secured firmly to prevent damage to pinned specimens. Although arranged neatly, this is not secure. The vials can easily bump over the pins during shipping. **This is risky if you mail your collection**. **Do not include vials with your pinned speimens.**
	
A specimen index should be submitted with your collection. Vials can be placed in a bag separately (on top of cardboard) from the pinned specimens. Packing material was used to add spacing between the collection lid and the vials.	Nicely aranged collection with properly sized locality labels. The index is securely attached to the lid of the collection box.
	
This collection has beautifully arranged spread wings of Orthoptera, Hemiptera and Coleoptera. Only Lepidoptera are required to be spread for grading, but this is a beautiful technique you are encouraged to use.	To have nicely spread specimens, you will want to arrange appendeges with pins holding them in place while drying. Usually 5 days is enough time.

	
Improperly curated collection: Incorrect pins, labels too large, points too large, not arranged neatly.	Insects outside of a box will not be accepted.Collections must be in a box in order to prevent damage. Our department receives several humdred collections each semester, so each collection needs to be secure.

- All specimens need to have a locality label and be identified to Order.
- Please see the collection grading rubric online. At a <u>minimum</u> your collection should contain the following.

Insect Collection Guidelines
ENY 3005L – Principles of Entomology Lab
40 **adult** insects of **different** species (No immatures – check for those wing buds). Please do not submit more than 50 total insect specimens. All specimens must be curated, identified to order, and labeled (small labels with 4pt font). • Duplicate specimens and immature specimens will not be counted. • Specimens may not be purchased, may not come from previously graded collections, or may not come from colonies (USDA, Colleges, etc.) • Up to 10% of your collection may be traded with other students currently enrolled in the class. The collector's name must be included on the label. (Please be sure to follow social distancing guidelines for your area)
14 representative orders
2 Lepidopterans properly spread (minimum) – All Lepidopteran specimens must be spread.
5 insects mounted on points (proper size, glued to tip on right side of insect with head facing up)
3 non-insect arthropods identified to order (these specimens may be pinned because of shipping) *these do not count towards your number of adult insects
Collection index with order names and number of specimens

ENY 5006L – Graduate Survey of Entomology Lab
56 **adult** insects of **different** species (No immatures – check for those wing buds). All specimens must be curated, identified to order, and labeled (small labels with 4pt font). 15 insect family IDs with family labels highlighted under the locality label. • Please do not submit more than 65 total insect specimens. • Duplicate specimens and immature specimens will not be counted. • Specimens may not be purchased, may not come from previously graded collections, or may not come from colonies (USDA, Colleges, etc.) • Up to 10% of your collection may be traded with other students currently enrolled in the class. The collector's name must be included on the label.
16 representative orders with **15 specimens identified to family (all 15 families should be different – for example, you should not have two Libellulidae as part of your 15) using the textbook keys**. When keying out the family names, you should identify at least two of your specimens from each of five of the following orders (10 total). The additional five identifications are your choice. Two families from five of the following: Odonata, Hemiptera, Coleoptera, Diptera, Hymenoptera, Blattodea, Orthoptera, Lepidoptera. **These family names should be included on your collection index and on a pin label.** *The family label should be added to your pinned specimens, and family names should be included under the order name on your index. *Please highlight the locality labels of your specimens labeled to family.*
4 Lepidopterans properly spread (minimum) – All Lepidopteran specimens must be spread.
10 insects mounted on points (proper size, glued to tip on right side of insect with head facing up)
5 non-insect arthropods identified to order (these specimens may be pinned) *these do not count towards your total number of adult insects
Collection index with order and family names and number of specimens

***Collection index template is available in Canvas, and completed form must be included with collection.**

ENY3005L/5006L Course Outline

Note that lab assignments are due on Wednesday and lecture assignments are due on Sunday and some Fridays so you don't have multiple assignments due on the same day.

Lab	Points	Activity	Complete by: 11:59PM
• Order Collection Equipment • Take the Orientation Quiz • Lab 0 - Collection and Curation	10	Get started on your collection and take the orientation quiz	5/14
Lab 1 & 2 - Insect Internal and External Morphology	20	Lab 1 Quiz	5/21
Meet and Greet on Zoom	5	Zoom meeting with Dr. Baldwin to discuss insect collecting and meet others to form collecting teams.	(Groups from **lecture** work for this as well. Only one meeting is needed.)
Lab 3 -Using a Dichotomous Key *Remember to collect insects each week*	15	Create a Key Worksheet	5/28
Lab 4 – Insect Behavior/Vision	30	Experimental Design Outline	6/4
Mini-collection Photos	15	Collect, identify and curate 10 insects. Take several photos for evaluation.	6/11
Lab 5 – Pest Management Parts 1 and 2 *-Feedback given weekly to improve before final report is due.*	15	**Worksheet** Conduct Experiment (supplies needed)	6/11

		Search for scientific literature Lab Report – **Introduction and References**	
Lab 5 – Pest Management Parts 3 and 4	--	Lab Report – **Materials & Methods** **Results** **Discussion & References**	**6/18**
SUMMER BREAK			
Lab 5- Final Lab Report	65	**Final Lab Report**	7/9
Lab 6 – Social Insects *Finish pinning and labeling collection*	15	Worksheet	7/16
Final Collection Due	**100**	Submit properly curated collection or have shipped collection **to arrive** by this date.	**7/21**
Lab 7 - Soil Arthropods	15	Worksheet	7/23
Lab 8– Forensic Entomology	20	Evidence Reports	7/30
Lab Final Exam (Online)	**70**	**Exam**	8/4 MONDAY
Lab Video Playposit interactions	**45**		**Throughout semester**

Evaluation (450 possible points)

Grading Scale

Percent	Grade	Grade Points
100 - 94	A	4.00
<94 - 90	A-	3.67
<90 - 87	B+	3.33
<87 - 84	B	3.00
<84 - 80	B-	2.67
<80 - 77	C+	2.33
<77 - 74	C	2.00
<74 - 70	C-	1.67
<70 - 67	D+	1.33
<67 - 64	D	1.00
<64 - 61	D-	0.67
<61 - 0	E	0.00

Please visit https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/ for the UF policy on grading.

Text and Supply information

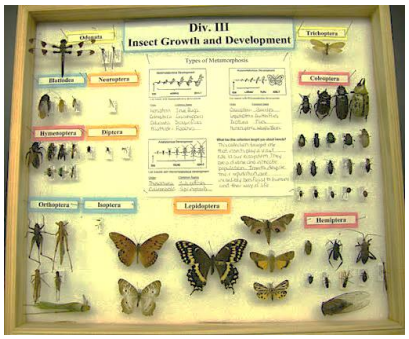
The lecture textbook will be used for some lab assignments (Daly and Doyen's Introduction to Insect Biology and Diversity 4th Edition). An optional book that will be helpful for this lab is the Photographic Atlas of Entomology and Guide to Insect Identification by J. L. Castner. This book is about $45 and has nice photographs that will help you in identification of your collection specimens. **Please use orders presented in the lecture as some names have changed since the Castner publication.**

Collecting Kit

Each student is *required* to make an insect collection. You may purchase a kit of collecting supplies or follow the collection and curation lab instructions on how to make a net and kill jar. Either way, you will need to submit a properly curated insect collection. Here are some purchasing options for collecting kits. Feel free to shop around on your own. Just be sure to make your purchase within the first week of class so you can begin collecting. You will want insect pins, a collection box, a net, and a spreading board. A killing jar and pinning block are also nice to have, but can be substituted with homemade items or a ruler. Insider tip: You will also need a hole punch and index cards to make points. A round hole punch where you can cut the circle into triangles is more cost effective than purchasing an insect point punch.

Note: Students often ask about the wooden display boxes with glass tops we use in entomology. Those are called "Cornell Drawers," and with a foam bottom (plastazote)over the bottom board costs about $60-80 depending on wood preference. The lid is designed to fit tightly to protect specimens. Also, when you purchase pins, the size you will need for this class will be insect **pin size 2 or 3 and should be enameled**. If not enameled, the pins can rust through. As you shop, remember that your shipped collections will not be returned at the end of the semester.

***If you purchase a box from a craft store, it is unlikely that insect pins will fit. You may need to clip the tips of the pins, after curation, to fit them under the glass. This is okay, as long as it is professionally arranged. Please make the box safe to handle so pins are not exposed. Plastozoate is the preferred foam for the bottom of the display box.**



Example of a Cornell Drawer

Feel free to shop around for insect collecting materials. You may share your shopping finds in the Canvas chat.

Note that students have had negative experiences purchasing insect pins through Amazon and have had some frustrations with the small size of display box they initially ordered (inspect the box size before purchase). Based on student experience, the Amazon pins are thin and bend when trying to pin an insect. This causes frustration and damage to the specimens. The minimum box size should be around 13x9x2.5. The standard white or black boxes ship well, so are recommended. In addition to the sites below, also see Ecology Supplies or Forestry Suppliers.

Ecological Supplies

https://ecologysupplies.com/products/student-insect-collection-kit/

This company recently began to offer student insect collecting kits. They have foldable insect boxes with the plastazote foam that is good for shipping and will hold the pins in place. (Be sure to push the pins all the way to the bottom of the foam). This is a nice kit for those just beginning insect collecting, and is inexpensive. Right now, they are offering the kit for just under $60. It only comes with one box, so you may wish to add an additional collecting box (see note below about boxes.) Limitations to this kit include the small size killing jars and the foam spreading board, but if you continue collecting, you can expand to a larger jar and an adjustable wooden spreading board. All in all, this is a good kit for this course. The pins are size 4, but those will work for most of your specimens. (I generally recommend size 2 or 3).

Pin-It

https://pinitentomology.com/

This is a company that was started by former employees of BioQuip, the #1 US entomology supply company for more than 75 years that recently closed (2022), after the passing of the original owner. They are expanding their inventory as the company gets off the ground. They have quality foldable boxes that are good for shipping, and have high quality insect pins (important for strength, resistance to rust and breakage). They don't yet have spreading boards or nets available but should in the near future. I would recommend one or two folding boxes and one package of size #2 or #3 pins. If you have a preference for collecting butterflies and dragonflies, you will want two boxes. With that said, and with careful packing, one box should be sufficient for the undergraduate collections, and two for graduate students. Boxes are $6.79 each + shipping. This design is good for shipping, the foam holds the pins well, and they are economical to ship for collection evaluation.

Home Science Tools

https://www.homesciencetools.com/product/deluxe-insect-collecting-kit/#description-anchor

This insect collecting kit comes with a net, pins, killing jar, display box, simple foam spreading board, and a pinning block. (Please use the order names taught in the class. The booklet in this kit has older taxonomic names.) Students have had experience with the sides of the box splitting, so you may want to reinforce the inside corners of the box with some strong tape. The telescoping net has also had issues with the locking mechanism, but this is a convenient kit that has a pinning block, net, pins, and a collection box. $71.95 + shipping

Shop Atelier Jean Paquet (Canada)

https://www.atelierjeanpaquet.com/en/ This is a shop in Canada that provides quality Cornell Drawers, pins, nets, blocks, etc. There isn't a kit available, but you can select the gear you prefer. This shop also offers wooden pinning blocks and spreading boards. The prices are in Canadian dollars, so you much contact the company for pricing details. Cornell drawers are the nice wooden with glass top insect collection cases. They are expensive to ship for grading but are nice for insect displays.

Educational Science

Entomology collecting kit # EL301 or
Entomology collecting kit # EL201: available from
https://www.educationalscience.com/advanced-insect-collecting-kit-with-butterfly-net-and-display-case-with-glass-lid-el301 or
https://www.educationalscience.com/index.php/entomology-kits.html

The kit (with net) is approximately $59.99 + $12.99 shipping and taxes according to your geographical area. The kit includes your basic collecting equipment (net, jar, pinning block, pins, foam spreading board, and cardboard collection box). This kit is the most popular with students, because of the price, but the box is only for temporary storage of your specimens. **IMPORTANT NOTE: Over the past year, the foam has been really thin and requires effort to keep the pins in place. This has caused damage to multiple student collections. If you purchase this kit, you may want to add a layer of foam insulation board, from a hardware store or plastizote foam, from an insect supply company, to hold your pins in place. The foam board is the blue or pink insulation boards found in hardware stores.**

Other Lab Purchases for the Lab Report Experiments

The Pest Management lab requires items (i.e. live insects, household cleaner, cups with lids, paper towels), so be sure to make a list of needed items for both labs. It is very important to watch the weather and make sure that you have proper conditions when running the experiments. Also, this experimental lab will take some time to set up and perform. It is

important to read it ahead of time and watch the lab module so you have time to properly set up the experiment. There are some supplies (above) you will need to purchase, so keep that in mind. You may need an extra couple of days to work out some details, so don't wait until the last minute. You have been allotted several weeks for this lab. You will need that long to complete the experiment, find your references, and write all sections of the report. You will have an opportunity to make any corrections suggested by the TA and submit a final draft.

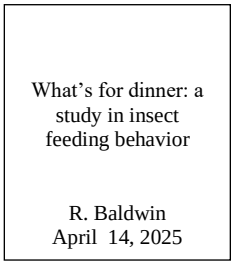
Exam

The lab exam will consist of fill in the blank, matching, short answer, and identification. It will be online through Canvas, open from 8:00am-11:59pm (EST). The exam will be worth 70 points. If you are unable to take the exam on the posted date and time, please contact your instructor/TA to make other arrangements.

Lab Report

There is one lab report that will be completed in sections so feedback can be given and corrections made prior to final submission. Each section and the final report should be posted to eLearning by the due date to avoid a late penalty (5 points per day). Each report should be typed with a professional font with 12-point type. The report should be double-spaced and pages should be numbered, except page 1. Be sure to proofread your report for any errors. **Plagiarism will result in significant point deductions and may result in a failing grade. This includes incorrectly paraphrased passages, incorrectly formatted in-text citations, and incorrectly formatted references sections.** Plagiarism will be reported to the Dean of Student's Office.

The title page should contain your name, the title of the lab, and the date of the lab. The lab report should also be free of any typos and spelling errors. If you post the report as an attachment, please begin the file name with your last name then the title with no spaces (i.e. Baldwinvisionreport). The report must be submitted as .doc or .docx format. If you do not have MS word, contact the TA to make other arrangements (Canvas only accepts some document formats).



Title page example.

Each report should contain the following sections: title page, abstract, introduction, materials and methods, results (graphs), discussion and references.

Abstract	This is a brief (1 paragraph) overview of the entire paper. The abstract consists of 1-3 introductory sentences, a sentence stating your objective, 1-2 sentences discussing your materials and methods, 1-2 sentences stating results, and 1-2 conclusion sentences. Although this is one of the first sections in your lab report, it is easiest to write this section last, after all of the other sections have been completed. Feel free to pick up a science journal at a nearby library or online source and see how this is written.
Introduction	Give some background information about the topic and lab activity. **What was the lab set up to teach and why? What research has been done in this field?** This section should provide a good rationale for why your study was important and introduce what you plan to do. This portion of the paper is where you provide relevant background information on the subject and provide important concepts for the reader to understand your experiments and analysis. You need ample

	references for this section. Visit http://guides.uflib.ufl.edu/distancelearners for e-resources. At the end of this section, **you must clearly state your objectives and hypothesis**.
Materials and Methods	A detailed description of the equipment and procedures used to conduct this lab. I should be able to replicate your experiment from the information you give me here. This is not a shopping list of what you used. It must be written in complete sentences (paragraph format) and not in first person. Example: **INCORRECT**- I poured one tablespoon of dishwashing liquid into the handheld spray bottle. **CORRECT** - One tablespoon of dishwashing liquid was added to a handheld sprayer. Note:You have completed the experiment at this point, so should report in past tense.

Results	A detailed report of what you discovered as a result of this lab. Here, you describe *what* happened, not *how* or *why* (don't interpret the information). **You do not explain what the results mean, just what they are.** Any **graphs or tables** should be included here. Failure to include the appropriate table and graphs will result in a poor grade on this section. Each chart, table, graph, etc. **requires** a title and a caption that explains it. If you have, for example, two tables separated by a graph, you have Table 1, then Figure 1, then Table 2. You must also clearly label x and y axes.
Discussion	Here is where you explain and analyze the results. **Do your results support or fail to support your hypothesis? How did your treatments affect your dependent variable?** Are there any special circumstances that affected the experiment? Did you have to modify anything? Do you have any missing data? What did you learn from this experiment? What are the possible implications of your results? These types of questions should be answered in the discussion section. This section is not merely a brief repeat of the Results section. Here, you explain how and why (or why not) the results you obtained actually occurred and how this related to your hypothesis. This is the section where you *must* think critically and analyze, providing explanations for what you observed and measured. Failure to do it thoroughly will result in a poor grade on the lab report.
References	Include an alphabetical list of your references using the **ESA style guide,** https://academic.oup.com/jme/pages/Manuscript_Preparation#References. ESA is the Entomological Society of America, and this example is for Medical Entomology. In this section, provide the complete literature citation (author(s), date, title, journal, volume, pages) for all works you cited within the paper. Here, you are to provide a **MINIMUM of five (5) references** that pertain to the subject of your lab report. **These can be books or journal articles.** For this report, they can NOT be newspaper articles, popular press magazines, extension publications, or web URLs. I suggest looking at the reference section of a scientific paper for some guidelines. *Just as a reminder: in the text portion (introduction or discussion) of the report, you*

	would place your reference in parentheses like this (Amrine and Noel 2006). If more than two authors are in the citation, then (Baldwin et. al 2022). Some sites to search for scientific journal articles online are: Web of Science: http://apps.webofknowledge.com/WOS_GeneralSearch_input.do?SID=4DHk3cqp6dLkrObdy4Y&product=WOS&search_mode=GeneralSearch&preferencesSaved=&PointOfEntry=home Google Scholar: http://scholar.google.com/ Pubmed: http://www.ncbi.nlm.nih.gov/pubmed (*Note: as a UF student, you should not need to pay for online scientific articles. You may visit the UF Library website for instructions on logging in through the VPN to access UF article subscriptions.)* Example of a reference in the reference section: Amrine, J. W., and R. Noel. 2006. Formic acid fumigator for controlling varroa mites in honey bee hives. International Journal of Acarology. 32(2):115-24.

Enjoy the semester and good luck on your collection!

UF POLICIES

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

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/UGRD/academic-regulations/attendance-policies/#absencestext.

Evaluations: Course Evaluations are submitted through GatorEVALS in Canvas.

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

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: https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/. **Copying, screen printing, photographing, or viewing another student's exam materials is a violation of the UF Honor Code**. **Copying, screen printing, or photographing any exam material is a violation of the UF Honor Code.**

Plagiarism in this class will not be tolerated. All work submitted must be in your own words and proper citations must be given for sources of ideas.

Besides group projects, all other graded coursework must be completed independently. Sharing of exam or quiz information will be considered academic dishonesty and a failing grade will be assigned. All students, those giving and receiving information will be referred to the Dean of Students for Academic Dishonesty.

**Insects collected must be collected legally (no collecting in state or national parks) and must include accurate locality labels including the collector's name. Purchased insects are not allowed. Collections are marked each semester as they are graded, and specimens may not be recycled for future collections (unless allowed on the syllabus). Collections submitted with any falsified label information, or marked, purchased, or illegally collected specimens will be marked as a zero, and the student refereed to the Dean of Students Office for academic dishonesty.*

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.

Distance Education - 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.

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
- •U Matter We Care, www.umatter.ufl.edu/
- •Career Connections Center, First Floor JWRU, 392-1601, https://career.ufl.edu/.
- Student Complaints: Online Course: http://www.distance.ufl.edu/student-complaint-process

UF Online Class Recording Policy

Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized sharing of recorded materials is prohibited except as allowed by Florida House Bill.

Distance Education - 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.

Use of AI
When used properly, generative artificial intelligence (AI) programs (such as ChatBots/LLMs) can be helpful tools to enhance your learning. However, improper use of these tools can impede your learning and/or be considered academic dishonesty. Thus, it is critically important to learn how to use these tools responsibly and ethically.

Unless indicated, you are not permitted to use AI-generated content in your assignments. This includes– but is not limited to– submitting AI-generated content as your own work, submitting content that was paraphrased or edited from an AI output, quoting text generated by an AI (even if properly cited), and using AI to generate false sources. Assignments, except where instructions clearly allow AI, should consist entirely of your own original work, created by you for this class. Unauthorized use of AI in an assignment will be considered academic dishonesty.