

The Insect Diversity of East Texas (Entomology Lab)

BIOL 4132 Fall 2022

Dr. Jon Seal BEP 264,

Meeting Place and Time: BEP 124, Tuesday 2-4:50 pm

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Course Objectives: Insects are the most diverse taxonomic group on earth and comprise a significant portion of biomass in many terrestrial ecosystems. Consequently, insects have attracted the attention of conservation biologists in recent years; however their study requires specialized knowledge and skills.

This course is designed to give brief exposure to most facets of studying insect biodiversity, which includes an introduction to the primary literature, collecting and quantitative methodology, the preparation of specimens and ultimately the identification of insects to the level of family. Most of this we will accomplish by preparing a collection of local insects.

We will furnish the collecting equipment, boxes, killing jars, traps, vials, net and cabinets on loan. **You must return this equipment at the end of the course. Failure to do so will result in the withholding of your grade.** Hand lenses are quite helpful in observing and finding insects in the field. You might wish to purchase one.

Textbook: One textbook is **required**: *Insects of North America* (Princeton Field Guides) by John C. Abbott and Kendra K. Abbott. We will also have several entomology texts in the laboratory room that will aid in the identification of insect families, subfamilies and sometimes genus and species that you can use. There will also be some assigned readings, for which there will be a short quiz.

Assigned Reading List (TBA)

Suarez, A. V., and N. D. Tsutsui. 2004. The Value of Museum Collections for Research and Society. *BioScience* **54**:66-74.

Tewksbury, J. J., J. G. T. Anderson, J. D. Bakker, T. J. Billo, P. W. Dunwiddie, M. J. Groom, S. E. Hampton et al. 2014. Natural History's Place in Science and Society. *BioScience* **64**:300-310.

Tschinkel, W. & Wilson, E. (2014) Scientific Natural History: Telling the Epics of Nature. *BioScience*, **64**, 438-443.

Evaluation. **There are 100 points possible in this course.** The breakdown is below.

- a. readings quiz (10 points max)
- b. orders quiz (10 points max)
- c. morphology/anatomy quiz (10 points max)
- d. insect collection (unlimited points possible; see point breakdown below)

Your grade will be calculated out of 100 points. This means if you ace the three quizzes, you will need at least 70 collection points OR undergraduates may need 50 collection points and 20 points from the essays. You could also get to 100 points if you received 100 points for the collection but no points on the quizzes or essays. There are many ways to get to 100. My recommendation is to focus on the insect collection and do everything possible to get points elsewhere.

Final letter grade will be based on a straight percentile scale (i.e., $\geq 90\%$, A, 80-89%, B, etc.) Note that there is no maximum points for the collection (the more you collect, the more points you get), and the minimum points required are dependent on your quiz grades.

Points for the collection are allocated as follows:

The first 20 orders	1 point each
Orders above 20	5 points each
Families (and subfamilies)	1 point each
Neatness	10 points max

Quizzes: There will be three quizzes. One will deal with insect anatomy /morphology, another with insect order identification and a third with assigned readings. Additional details will be announced in class.

Collection: The bulk of your grade will come from your insect collection. Each student must curate their own insect collection; however, you may share insects with others if you have excess specimens, *i.e.*, you will collaborate with one another to get the insects you need for your collection.

You must find living insects in Texas or nearby states (Louisiana, Arkansas, Oklahoma or New Mexico). If you travel elsewhere, take your collection materials with you but please let me know in advance. Also, keep in mind that this course is taught every two years.

Please realize that if you fail the course, you will wait two years to take this class again.

Important: This class will require a considerable amount of work conducted outside of class. Plan on looking for insects earlier in the semester rather than later. Since this is fall and most insects will eventually go dormant or migrate away, most collections will take place during the first half of the semester. Also, try to pick times when insects will be easy to find. Insects are usually hard to find when it is hot, dry or cold. If you are looking earlier in the semester, look in the morning or early evening. If you are looking for insects on a cool day, say by late October, look during the warmer parts of the day. Below 60 degrees, few insects are active, likewise above 90-95, they tend to retreat to cooler areas (below ground, in the shade, etc.). Likewise, if the daytime temperature is

104°F as can occur in August and early September, it's best to wait until evening or early morning if not for a few days. This means that the best time to collection insects will likely be in the early morning or evening and generally from mid September through the end of October. Time is short, plan now and act accordingly.

DO NOT UNDERESTIMATE THE AMOUNT OF TIME THIS CLASS WILL REQUIRE.

It would be a good idea to clear your weekends during the first half of the semester and otherwise make time to collect insects and prepare your collection. Also, take advantage of warm spells throughout the semester. This class gives you the excuse to go camping or hiking (be aware of laws about collecting on public lands, however!). I also recommend that you collect on your own during the entire period, especially if you are going someplace warmer (*e.g.* south Texas or south Florida) over the Thanksgiving holidays. If you go camping, take your collection materials. However, if you are camping on public (state or federal) land, realize that there are criminal penalties for collecting without permits.

Start collecting now and continue to collect!

You should have most of your insects collected and pinned by early November and be spending the last few weeks identifying your insects.

Excursions: We will take excursions on university grounds or the TPWD Nature Center to collect insects. Field excursions will be announced the evening before on Canvas or email. Do not rely exclusively on these field trips for your collections.

Schedule: Each weekly meeting will be spent introducing methods or aspects of insect biology, an overview of select orders and/or an open lab where you spend time collecting or preparing your collection. Most of the labs will be unstructured and have an open format so that you have time to collect, identify and/or prepare your collections. I will be in the classroom during these period to answer any questions you may have.

Week of	Topic or Activity
Aug 24	Introduction to class, collecting and preserving insects
Aug 31	Morphology of Insects Orders: Hexapod arthropods and the Apterygota
Sept 7	Orders: Ephemeroptera and Odonata Quiz (anatomy)
Sept 14	Open lab; collecting, pinning, identifying your insects)
Sept 21	The 'Orthopteroid' Orders
Sept 28	Orders: Psocodea ('lice') and Thysanoptera Open lab; collecting, pinning, identifying your insects)
Oct 7	Order: Hemiptera Open lab (collecting, pinning, identifying your insects)
Oct 14	Orders: Lepidoptera and Trichoptera Open lab (collecting, pinning, identifying your insects)
Oct 21	Orders: Diptera, Mecoptera and Siphonaptera Quiz (readings) Open lab; collecting, pinning, identifying your insects)
Oct 28	Order: 'Neuroptera' Open lab (collecting, pinning, identifying your insects)
Nov 5	Order: Coleoptera Open lab (collecting, pinning, identifying your insects)
Nov 12	Order: Hymenoptera Open lab (collecting, pinning, identifying your insects)

Nov 19	Open lab (collecting, pinning, identifying your insects)
Nov 23	Thanksgiving Holiday week – no class!
Nov 30	Quiz (orders) Final curation, all work due

Artificial Intelligence Statement

For this course, **AI is not permitted in this course at all.** I expect all work students submit for this course to be their own. I have carefully designed all assignments and class activities to support your learning. Doing your own work, without human or artificial intelligence assistance, is best for your efforts in mastering course learning objectives. For this course, I expressly forbid using ChatGPT or any other artificial intelligence (AI) tools for any stages of the work process, including brainstorming. Deviations from these guidelines will be considered a violation of UT Tyler's Honor Code and academic honesty values.

Use of keys and electronic sources. This course will require that you identify insects using morphological characters. The assigned books will help you learn this skill. While online sources such as iNaturalist or Google Lens are available, these sources are frequently incorrect and should be used sparingly. Also these sources may give you an answer but they do not tell you why. As a result, the quizzes may not only require you to identify orders or families but I may ask you why you came to that decision – which traits these orders have that you used to make the identification.