

The Insect Diversity of East Texas (Entomology Lab)

BIOL 4132, 5132 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**: *The Field Guide to the Insects* (Peterson Field Guide Series) by Borror and White. 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)
- e. Undergraduates may write up to two 1-2 page essays on insects that you find (20 points max).

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. **Since only undergraduates may write essays for credit, graduate students will be required to complete a larger insect collection.**

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. The completed reading assignment will be uploaded on Canvas by the deadline announced in class. Assignments not uploaded by the deadline will result in 0 points. Emailed assignments are not accepted. Plan ahead. **Do not wait until 5 minutes before the deadline to submit your assignments.** 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.

Essays. Of the insects you identify for your collection, you will be required to describe the biology of three of these in succinct 1-2 page single spaced essays where you summarize an aspect of this insect's natural history (ecology, evolution, physiology, biochemistry, etc.) using at least 5 peer reviewed sources (undergraduates). While this may seem like a lot, realize that many articles in entomological journals can be short, especially those that are found toward the back of many journals that have 'Short 'Communications' or 'Short Notes' formats where the articles are usually less than 5 journal pages (about 2 normal sheets of paper). In other words, you do not need to necessarily read and cite 15 page papers. It is fine, if you get enough information to write about from 5 short research papers. Also, realize that not every feature of a longer scientific paper will be relevant to your essays, so try not to get bogged down in various minutia of a scientific paper. Usually a scientific paper has a single finding that can be summarized in one or few sentences. Often the main point of an article is in the title. Realize that the insects you describe in your essays, you must correctly identify and label. If you wish, you may take a photograph of the insect you find before you pin it and include the photo in your essay.

While, you may use any source that is a peer reviewed journal, probably the best choices would be entomological journals. See list at the end of this document. Of course, there are good articles in ecology and evolutionary journals such as *Ecology*, *Journal of Animal Ecology*, *Evolution*, *Evolutionary Ecology*, *Animal Behaviour* *Ethology*, etc., but sometimes these articles are difficult to read because they address a complex concept or theory. Sometimes in these journals, the primary focus is on the theory or hypothesis and on the insect secondarily. For this course, you should focus on the biology of the insect. Write about what is known of these insects. *Science*, *Nature* and others (*Proceedings of the National Academy of Sciences*, *Proceedings of the Royal Society*) might also have good articles but then again the emphasis may or not be on the insects themselves. *Science* and *Nature* are sometimes good because the articles are short and often for a general audience, but again the focus is not always on the insect. Don't avoid old articles. Natural history was much more common than it is today. For example, *The American Naturalist* nowadays is a journal devoted to theory and concepts in ecology and evolutionary biology; however before the 1960s, as the name suggests the journal was devoted to natural history. Some of my favorite old articles were published in this journal in the late 1800s (e.g., [Morris, *The American Naturalist* 15: 100-102!](#) Even now, *The American Naturalist* has a section called 'Natural History Miscellany' section that contains some traditional natural history.

It may take some time for you to find articles, but it is possible. If you need assistance, let me know. Also, realize that some insects will be better understood than others (there are millions of insect species on earth, after all).

You may look for papers directly in journals or using an online database, such as Web of Science (isiwebofknowledge.com) or Google Scholar (scholar.google.com). To use the Web of Science, you will need to be on campus using a university IP address through the Secure Air WiFi. Most journals are behind a paywall; fortunately, our university library has subscriptions to most of the journals to which you will need access. If you cannot access these articles while on campus, you can request the article through Interlibrary Loan (ILL), which you may access through our library https://www.uttyler.edu/library/circulation/interlibrary_loan.php. ILL usually can get you a copy of the article within a few days. Finally, I realize that you may find insects for which little has been published. If this is the case, you may find relevant papers on other species in the same genus of the insect you found. You may also discuss what is known about the family, but not higher than family (not orders, classes, phylum or kingdom, domain, etc.) Discussing and citing these papers is ok.

You will be graded on good concise writing. See example of an essay posted on Canvas. While this example essay is fairly comprehensive (I chose an insect for which a fair amount is known), your essays do not have to cover all aspects of the biology, ecology, evolution, physiology of the insects you find and select. The coverage in the short essay on Canvas is fairly broad. I could also have written up a short essay on just one of the topics (say, ecology or evolution or behavior). Either being broad or specific in your essays is ok. These essays are not unlike what you could find at a zoo, museum, state or national park, among other venues that involve outreach. I also included more references than necessary. Also, make it evident from the

writing that you read the papers you are citing. Make sure if you cite something that the citation actually supports the claim you are making. Don't try to fake it, in other words.

I will provide more information on the essays but **good essays will have a strong narrative or story**. Natural History, as the name suggests, is a historical narrative of nature. Just as someone may study the history of the American Revolution, many biologists study the history of nature. Not so good essays will summarize the findings of the papers you read without any framework. Tell a good story (using facts, findings from the scientific literature) about the insects you found. Realize that biologists and historians (and academics generally) are basically telling a non-fiction story.

Note: No plagiarism of text or images! The text and photographs must be yours. If you plagiarize, consequences will be dire, see section on plagiarism below. Please realize that I have a good idea which insects you will find in east Texas. This is the 6th time I have taught this class at UT Tyler and have been working with insects in the southern US for nearly 20 years. If you submit photographs of something from not around here, I will need an explanation, otherwise I will consider this a case of plagiarism and falsification of data. You must find living insects in Texas or nearby Louisiana, Arkansas or Oklahoma. Also, keep in mind that this course is taught every two years. If you plagiarize and 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!

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.

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.

Week of	Topic or Activity
Aug 26	Introduction to class, collecting and preserving insects
Sept 2	Morphology of Insects Orders: Hexapod arthropods and the Apterygota
Sept 9	Orders: Ephemeroptera and Odonata Quiz (anatomy)
Sept 16	Open lab; collecting, pinning, identifying your insects)
Sept 23	The 'Orthopteroid' Orders
Sept 30	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 4	Order: Coleoptera Open lab (collecting, pinning, identifying your insects)
Nov 11	Order: Hymenoptera Open lab (collecting, pinning, identifying your insects)
Nov 18	Open lab (collecting, pinning, identifying your insects)
Nov 25	Thanksgiving Holiday week – no class!
Dec 2	Quiz (orders) Final curation, all work due

Entomology Internet Links

Insect Collections:

Texas Natural Science Center (UT-Austin)

<http://www.utexas.edu/tmm/tnhc/entomology/index.html>

Texas A&M <http://insects.tamu.edu/feature/museum/>

American Museum of Natural History (New York City) <http://www.amnh.org>

Field Museum (Chicago, Illinois) <http://www.fieldmuseum.org>

National Museum of Natural History (Washington, DC) <http://www.mnh.si.edu>

Arthropods of La Selva (Costa Rica) <http://viceroy.eeb.uconn.edu/alas/alas.html>

Louisiana Arthropod Museum (Baton Rouge) <http://www.agctr.lsu.edu/arthropodmuseum/>

Mississippi Entomological Museum <http://www.msstate.edu/org/mississippientmuseum/>

Florida State Collection of Arthropods <http://www.fsca-dpi.org/OverviewFrame.htm>

Entomological Societies:

Entomological Society of America <http://www.entsoc.org>

Florida Entomological Society <http://www.flaentsoc.org/>

Society of Southwestern Entomologists. <http://sswe.tamu.edu/>

Entomological Journals

Annals of the Entomological Society of America

Environmental Entomology

Ecological Entomology

Medical and Veterinary Entomology

Systematic Entomology

Insect Conservation and Diversity

Insect Diversity and Systematics

Coleopterists Bulletin

Journal of the Lepidopterists Society

Insectes Sociaux

Myrmecological News

Florida Entomologist

Journal of the Kansas Entomological Society

Journal of the Hymenoptera Research

Journal of Insect Science

International Journal of Odonatology

Non-insect specific but easy-to-read natural history journals that publish entomological research

American Midland Naturalist

Southwestern Naturalist

Southeastern Naturalist

Journal of Natural History

Student Resources:

Resources to assist you in the course

- [UT Tyler Student Accessibility and Resource \(SAR\) Office](#) (provides needed accommodations to students with document needs related to access and learning)
- [UT Tyler Writing Center](#)
- [The Mathematics Learning Center](#)
- [UT Tyler PASS Tutoring Center](#)
- [UT Tyler Supplemental Instruction](#)
- [Upswing \(24/7 online tutoring\) - covers nearly all undergraduate course areas](#)
- [Robert Muntz Library](#) and [Library Liaison](#)
- [Canvas 101](#) (learn to use Canvas, proctoring, Unicheck, and other software)
- Digital Support Toolkit (for supported courses only. Students are automatically enrolled in the toolkit for supported courses)
- LIB 422 -- Computer Lab where students can take a proctored exam
- [The Career Success Center](#)
- [UT Tyler Testing Center](#)
- [Office of Research & Scholarship Design and Data Analysis Lab](#)

Resources available to UT Tyler Students

- [UT Tyler Counseling Center](#) (available to all students)
- [MySSP App](#) (24/7 access to Student Support Program counseling through phone or chat and online wellness resources available in a variety of languages)
- [Student Assistance and Advocacy Center](#)
- [Military and Veterans Success Center](#) (supports for our military-affiliated students)
- [UT Tyler Patriot Food Pantry](#)
- [UT Tyler Financial Aid and Scholarships](#)
- [UT Tyler Student Business Services](#) (pay or set up payment plans, etc.)
- [UT Tyler Registrar's Office](#)
- [Office of International Programs](#)
- [Title IX Reporting](#)
- [Patriots Engage](#) (available to all students. Get engaged at UT Tyler.)

University Policies and Information

Withdrawing from Class

Students may [withdraw](#) (drop) from this course using the [Withdrawal Portal](#). Withdrawing (dropping) this course can impact your Financial Aid, Scholarships, Veteran Benefits, Exemptions, Waivers, International Student Status, housing, and degree progress. Please speak with your instructors, consider your options, speak with your advisor, and visit the One-Stop Service Center (STE 230) or email enroll@uttyler.edu to get a complete review of your student account and the possible impacts to withdrawing. We want you to make an informed decision.

UT Tyler faculty and staff are here for you and often can provide additional support options or assistance. Make sure to carefully [read the implications for withdrawing from a course and the instructions](#) on using the [Withdrawal portal](#).

Texas law prohibits students from dropping more than six courses during their entire undergraduate career*. The six courses dropped include those from other 2-year or 4-year Texas public colleges and universities. Consider the impact withdrawing from this class has on your academic progress and other areas, such as financial implications. We encourage you to consult your advisor(s) and Enrollment Services for additional guidance. CAUTION #1: Withdrawing before census day does not mean you get a full refund. Please see the [Tuition and Fee Refund Schedule](#). CAUTION #2: All international students must check with the [Office of International Programs](#) before withdrawing. All international students are required to enroll full-time for fall and spring terms. CAUTION #3: All UT Tyler Athletes must check with the Athletic Academic Coordinator before withdrawing from a course. CAUTION #4: All veterans or military-affiliated students should consult with the [Military and Veterans Success Center](#).

* Students who began college for the first time before 2007 are exempt from this law.

Artificial Intelligence Statement

UT Tyler is committed to exploring and using artificial intelligence (AI) tools as appropriate for the discipline and task undertaken. We encourage discussing AI tools' ethical, societal, philosophical, and disciplinary implications. All uses of AI should be acknowledged as this aligns with our commitment to honor and integrity, as noted in UT Tyler's Honor Code. Faculty and students must not use protected information, data, or copyrighted materials when using any AI tool. Additionally, users should be aware that AI tools rely on predictive models to generate content that may appear correct but is sometimes shown to be incomplete, inaccurate, taken without attribution from other sources, and/or biased. Consequently, an AI tool should not be considered a substitute for traditional approaches to research. You are ultimately responsible for the quality and content of the information you submit. Misusing AI tools that violate the guidelines specified for this course is considered a breach of academic integrity. The student will be subject to disciplinary actions as outlined in UT Tyler's Academic Integrity Policy. Refer to the About This Course section of the UT Tyler Syllabus Module for specific information on appropriate use of AI in your course(s).

Final Exam Policy

Final examinations are administered as scheduled. If unusual circumstances require that special arrangements be made for an individual student or class, the Dean of the appropriate college, after consultation with the faculty member involved, may authorize an exception to the schedule. Faculty members must maintain student final examination papers for a minimum of three months following the examination date.

Incomplete Grade Policy

If a student, because of extenuating circumstances, is unable to complete all of the requirements for a course by the end of the semester, then the instructor may recommend an Incomplete (I) for the course. The "I" may be assigned in place of a grade only when all of the following conditions are met: (a) the student has been making satisfactory progress in the course; (b) the student is unable to complete all coursework or final exam due to unusual circumstances that are beyond personal control and are acceptable to the instructor, and (c) the student presents these reasons before the time that the final grade roster is due. The semester credit hours for an Incomplete will not be used to calculate the grade point average.

The student and the instructor must submit an Incomplete Form detailing the work required and the time by which the work must be completed to their respective department chair or college dean for approval. The time limit established must not exceed one year. Should the student fail to meet all of the work for the course within the time limit, then the instructor may assign zeros to the unfinished work, compute the course average for the student, and assign the appropriate grade. If a grade has yet to be assigned within one year, then the Incomplete will be changed to an F, or NC. If the course was initially taken under the CR/NC grading basis, this may adversely affect the student's academic standing.

Grade Appeal Policy

Disputes regarding grades must be initiated within sixty (60) days from the date of receiving the final course grade by filing a Grade Appeal Form with the instructor who assigned the grade. A grade appeal should be used when the student thinks the final course grade awarded does not reflect the grades earned on assessments or follow the grading scale as documented in the syllabus. The student should provide the rationale for the grade appeal and attach supporting document about the grades earned. The form should be sent via email to the faculty member who assigned the grade. The faculty member reviews the rationale and supporting documentation and completes the instruction section of the form. The instructor should return the form to the student, even if a grade change is made at this level. If the student is not satisfied with the decision, the student may appeal in writing to the Chairperson of the department from which the grade was issued. In situations where there is an allegation of capricious grading, discrimination, or unlawful actions, appeals may go beyond the Chairperson to the Dean or the Dean's designee of the college from which the grade was issued, with that decision being final. The Grade Appeal form is found in the [Registrar's Form Library](#).

NOTE: The Grade Appeal Form is different from the Application for Appeal form submitted to the Student Appeals Committee, which does not rule on grade disputes as described in this policy.

Disability/Accessibility Services

In accordance with Section 504 of the Rehabilitation Act, Americans with Disabilities Act (ADA) and the ADA Amendments Act (ADAAA), the University of Texas at Tyler offers accommodations to students with learning, physical, and/or psychological disabilities. If you have a disability, including a non-visible diagnosis such as a learning disorder, chronic illness, TBI, PTSD, ADHD, or a history of modifications or accommodations in a previous educational

environment, you are encouraged to visit <https://hood.accessiblelearning.com/UTTyler/> and fill out the New Student application. The Student Accessibility and Resources (SAR) office will contact you when your application has been submitted and an appointment with the Assistant Director Student Accessibility and Resources/ADA Coordinator. For more information, including filling out an application for services, please visit the SAR webpage at <https://www.uttyler.edu/disability-services>, the SAR office located in the Robert Muntz Library, LIB 460, email saroffice@uttyler.edu, or call 903.566.7079."

Military Affiliated Students

UT Tyler honors the service and sacrifices of our military-affiliated students. If you are a student who is a veteran, on active duty, in the reserves or National Guard, or a military spouse or dependent, please stay in contact with your faculty member if any aspect of your present or prior service or family situation makes it difficult for you to fulfill the requirements of a course or creates disruption in your academic progress. It is important to make your faculty member aware of any complications as far in advance as possible. Your faculty member is willing to work with you and, if needed, put you in contact with university staff who are trained to assist you. The [Military and Veterans Success Center \(MVSC\)](#) has campus resources for military-affiliated students. The MVSC can be reached at MVSC@uttyler.edu or via phone at 903.565.5972.

Students on an F-1 Visa

To remain in compliance with Federal Regulations requirements you must do the following:

- Traditional face-to-face classes: Attend classes on the regular meeting days/times.
- Hybrid Classes: Attend all face-to-face classes convened by the instructor according to the schedule set for your specific course.
- Online course: Only one online course can count toward your full-time enrollment. Students are expected to be fully engaged and meet all requirements for the online course.

Academic Honesty and Academic Misconduct

The UT Tyler community comes together to pledge that "Honor and integrity will not allow me to lie, cheat, or steal, nor to accept the actions of those who do." Therefore, we enforce the [Student Conduct and Discipline policy](#) in the Student Manual Of Operating Procedures (Section 8).

FERPA

UT Tyler follows the Family Educational Rights and Privacy Act (FERPA) as noted in [University Policy 5.2.3](#). The course instructor will follow all requirements to protect your confidential information.

Absence for Official University Events or Activities

This course follows the practices related to [Excused Absences for University Events or Activities](#) as noted in the Catalog.

Absence for Religious Holidays

This course follows the practices related to [Excused Absences for Religious Holy Days as noted in the Catalog](#).

Absence for Pregnant Students

This course follows the requirements of Texas Laws SB 412, SB 459, SB 597/ HB 1361 to meet the needs of pregnant and parenting students. Part of the supports afforded pregnant students includes excused absences. Faculty who are informed by a student of needing this support should make a referral to the Parenting Student Liaison. NOTE: Students must work with the Parenting Student Liaison in order to receive these supports. Students should reach out to the Parenting Student Liaison at parents@uttyler.edu and also complete the [Pregnant and Parenting Self-Reporting Form](#).

Campus Carry

We respect the right and privacy of students who are duly licensed to carry concealed weapons in this class. License holders are expected to behave responsibly and keep a handgun secure and concealed. More information is available at <http://www.uttyler.edu/about/campus-carry/index.php>.