

Biology 3601/5607:S01 & SMC – General Entomology – Summer II 2019
Lecture M-F 9:00-10:15 Lab 10:30-1:15 WSB 109 & Fox 219
Syllabus

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Text: Triplehorn, C.A. and N.F. Johnson. 2005. Borror and Delong's Introduction to the Study of Insects. 7th edition. Other books of possible interest include Bland's How to Know the Insects, Castner's Photographic Atlas to Entomology and Guide to Insect Identification, as well as a handy field guide (Kaufman, Peterson, Audubon, etc.)

Course Description: This course will focus on classification, identification, ecology, evolution, physiology, conservation, and the economic importance of insects.

Student Learning Outcomes

The graduating biology student graduating with a BS in Biology should be able to:

- 1) The student will be able to demonstrate an understanding of basic biological concepts, including but not limited to evolution via natural selection, cell theory, and the role and function of DNA.
- 2) The student will be able to demonstrate utilization of various field techniques toward addressing scientific questions in the specific discipline. These field techniques can include, but are not limited to, plant collection and processing, various animal collection techniques, ecological surveying and sampling, and biodiversity indexing.
- 3) The student will be able to use biological instrumentation to solve biological problems using standard observational strategies.
- 4) The student will develop writing skills by summarizing and critiquing recent relevant biological literature.

The biology student graduating with a MS in Biology should be able to:

- 1) Understanding and implementation of scientific methodology.
- 2) Utilization of field techniques toward addressing scientific questions.
- 3) Be able to utilize statistics toward the analysis of data within the discipline.
- 4) Be able to effectively disseminate scientific findings using both written and oral communication.

Course Objectives: Over the course of this class, I hope the following objectives will be met:

1. To instill a sense of awe and excitement about insects and other arthropods.
2. To train the student in the skills required by a professional research

- entomologist, who develops and transmits new knowledge.
3. To familiarize the student with the student with the scientific method, and approaches used in the development of theory in entomology.
 4. To improve the student's skills in quantitative biology.
 5. To train the student in the identification of insects, to at least the family level.

Course Structure: In order to accomplish the above objectives, the following activities will be integrated by the student into an understanding of the science of entomology:

1. Lectures will cover the basic biology of insects and key topics of current concern and study.
2. Laboratories will provide practical experience with insect form and function, identification, and ecology.
3. A required insect collection will aid the student in learning about habitats in which insects live, their lifestyles, and other aspects of their lives.
4. Several field trips will be offered over the course of the term. These are intended to provide field experience as a group, and introduce students to a variety of means of insect collecting.
5. Tests and examines will enable students to gauge progress in learning the material.
6. Reading the textbook should be considered required for preparation for the class. The recommended book provides a very interesting coverage of insect life and taxonomy, and it is highly suggested that students consult the book often when identifying insects. The reading and studying of this material is to be self-paced, and students are individually responsible for the content covered in this course.
7. Students must appreciate that this is a lecture and laboratory course. Learning is the responsibility of the student, while the instructor aids by presenting information for the student to assimilate.

Grading: Your grade will be assigned based on the percentage of points you get out of a total possible 600 points. (100pt exams (2), 50pt Lab notebook, 50pt preview collection, 25pt lab quizzes (4), 200pts from insect collection).

Tests: There will be a total of 2 exams, each worth 100 points. Quizzes will be given throughout the semester to assess material between exams. If you miss an exam or quiz and have a legitimate excuse, contact me within 24 hours of the test and we will arrange a make-up test. If you do not contact me within 24 hours, you will receive a zero on that exam.

Collection: The collection will consist of at least **100 separate families** in at least **20 orders**. Only 10% of the collection may include other arthropod specimens (i.e. spiders, scorpions, centipedes, solfugids, etc.). Each specimen must be correctly prepared, labeled, and in good condition. More information about collections will be presented later.

Note – Collections are very time consuming and tend to be the biggest stumbling block for completing the course. To avoid a lot of stress trying to find enough different types of insects, it is imperative to start collecting NOW.

Preview Collection: To make sure you are off to a good start, a subset of your collection will be **due on Jul 22**. This preview of **at least 15 specimens** will be graded on correct pinning, pointing, spreading, labeling and preservation techniques. Identifications are not required (but will be considered if provided). Species should consist of 5 pointed, 5 pinned, 2 spread winged, and 3 alcohol specimens.

Attendance: Students missing 20% of lectures (5 lectures) shall be dropped from the class per the SRSU catalog. Any student dropped for excessive absences will receive an F for the course grade. Please notify your instructor BEFORE missing class for authorized activities, death in the family, or illness. Excused exams or quizzes may be made up on the day of the final exam.

Students with disabilities will be provided reasonable accommodations. If you would like to request such accommodations because of physical, mental, or learning disability, please contact the ADA Coordinator for Program Accessibility at 837-8203, FH 112.

Lecture courtesy: The general rules of classroom etiquette are below.

- 1) Please do not talk to others in class while the instructor is lecturing. If you have a question, ASK THE INSTRUCTOR! That's what I'm here for.
- 2) No eating, chewing, dipping, etc.
- 3) If you are going to attend class, please do so. Leaving and returning to class repeatedly is disruptive, as well as showing up after half the period is over.
- 4) Please turn cell phones and pagers to silent while in class. They are disruptive to the entire class, and distract others as well.

Tentative Lecture Outline

| Date | Lecture topic | Chapter |
|-------------|--|----------------|
| Jul 9 | Introduction, Arthropod characteristics and classification, | |
| Jul 10 | Collecting, preserving, and mounting insects - Collect on Campus | |
| Jul 11 | External Morphology, Insect Form and Function | |
| Jul 12 | Collecting trip to Kokernot Park/ in town | |
| Jul 15 | Diversity and identification of common insect orders | |
| Jul 16 | Feeding adaptations and mouthparts | |
| Jul 17 | Keying exercise - Flight and Movement | |

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| Jul 18 | Internal anatomy of insects |
| Jul 19 | Collection trip to the Post/ I-20 Preserve |
| Jul 22 | Life cycles, growth and development - Preview Collection due (Blacklight collection trip to the Post at night) |
| Jul 23 | Insect ecology, behavior, and social systems |
| Jul 24 | Midterm Exam |
| Jul 25 | Entognathous hexapods: Protura, Diplura, and Collembola |
| Jul 26 | Trip to vineyard/ranch /Sibley Center/other |
| Jul 29 | Collection trip to Tamarisk Beetle Sites (optional blacklighting at the vineyard the night before) |
| Jul 30 | Apterygotes: Primitive wingless insects |
| Jul 31 | Combined Collection Trip to CDRI |
| Aug 1 | Paleoptera: Dragonflies and mayflies |
| Aug 2 | Potential overnight collecting/camping trip to Terlingua Ranch |
| Aug 5 | Orthopteroids: Grasshoppers and allies |
| Aug 6 | Hemipteroids: Bugs, Homoptera, book lice and lice |
| Aug 7 | Neuropteroids: Neuroptera, Coleoptera, Hymenoptera |
| Aug 8 | Neuropteroids: Neuroptera, Coleoptera, Hymenoptera cont. |
| Aug 9 | Possible Collecting Trip (Balmorhea) |
| Aug 12 | Panorpoids: Diptera, Lepidoptera, Trichoptera, and others |
| Aug 13 | Work on Collections, Collections Due by 5pm |
| Aug 14 | Create an Arthropod Activity and Discussion |
| Aug 15 | 9:00am Final Lecture Exam |

Note – This outline is subject to change for reasons of course interest, time constraint, or instructor whim. The exams will be administered on the dates given, unless material relevant for a given exam has not been covered. Under such cases, an exam may be moved a class period or two to aid in the clarity and understanding of the material.

Graduate/Honors Course Credit Requirement: As with all modified undergraduate for graduate course credit classes, this course has extra requirements above and beyond those for the undergraduates. The extra length in which must be taken will include a small scale research project and write-up to be included with your insect collection. The research project must be approved by your instructor prior to beginning, and should work to understand a particular ecological or geographical aspect of entomology. Examples of potential projects (yet not limited to these) include the pollinators of a specific plant

species or community, the pests of a specific plant or community, a survey of particular ecological habitat (sand dunes, wetland, or other unique vegetative area), a survey of a particular niche (nocturnal insects, fossorial arthropods, aquatic insects), or a intensive survey of a group not emphasized in this course (scorpions, solfugids, whip-scorpions, pseudoscorpions, spiders, ticks, etc.). Please keep this separate project independent of your primary course collection, although you may use spacer tags in your main collection to refer to your special project collection for grading and fulfilling your collection requirements.

The write-up for this project should be stylized as a note or short manuscript following the instructions to authors for the journal, *Southwestern Naturalist*. You must include relevant citations, and document why you choose this particular study, the methods and materials you employed to conduct your study, what you found/collected, and what you think it means or tells us about the question you asked.

For grading purposes, this special collection and write-up will be worth a combined 200 points (100 points for collection and 100 points for the final paper). These are due at the start of the final exam on Thursday Aug 15th. If you complete your collection and paper earlier than this, early submissions are encouraged.