Welcome to BIOLOGY 225! This course introduces Texas habitats, flora, or fauna. In this section, we will emphasize insects and other invertebrates as we explore the pineywoods ecoregion.

Catalog description: Field studies of local plants, animals, or fungi and their native habitats. Different offerings of the course will emphasize different organismal groups, e.g., plants, birds, reptiles, amphibians, arthropods, mammals, fish, or fungi.

Instructor: Dr. Dan Bennett  
Department: Biology  
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Phone: 936-468-5163; Office: S-210  
Office Hours: Wednesday 1:00-4:00; Tuesday 2:00-4:00; and by appointment.

Lecture: Tu, Th 1:00 – 1:50 (S-211); Lab: Tu 2:00 – 4:50 (S-211)


GRADING SUMMARY:  
Exam I: 25%  
Exam II: 25%  
Exam III: 28%  
Activities: Lab reports, quizzes, assignments: 10%  
Literature research assignment: 3%  
Presentation: 4%  
Attendance & participation: 5%

Grading scale: A = 90–100%; B = 80–89%; C = 70–79%; D = 60–69%; < 60% = F

COURSE REQUIREMENTS:  
Exams and quizzes — There will be three exams including the final. Exams will cover content from both lab and lecture. The final exam will consist of material covered after exam 2 (75%) and comprehensive questions (25%). Questions will consist of true/false, multiple choice, fill in the blank, and short answer questions. It is crucial that you do not miss an exam. In the event of an excused absence, makeup exams will be given prior to the regularly scheduled exam, immediately after, or during finals week, at the discretion of the instructor. Only students with an excused absence will be allowed to make up an exam. Expect occasional quizzes to help you keep up with the material between exams. These will typically be announced at least ahead of time, though pop quizzes are a possibility. Your lowest activity score (which includes quizzes) will be dropped. There will be no makeup quizzes. If you miss a quiz or activity due to absence or tardiness, it will comprise that which is dropped.

Literature research assignment — Students will conduct a literature review on pollinators that will develop literature searching skills and synthesis of information. This project will involve COs 1-2.

Lab reports — Summaries of lab and field activities, observations, questions, hypotheses, images, data analysis and conclusions, will be developed and recorded in the form of lab reports. These activities will involve COs 1-4.
Presentation — Students will conduct a literature review of a marine invertebrate species and prepare a short presentation that will develop scientific communication skills. This project will involve COs 1-3.

PARTICIPATION AND ATTENDANCE: An excused absence is required for makeup work, including missed exams. University policy will be followed regarding unexcused absences; excused absences can be granted for university-sponsored events, illness with a doctor’s note, or death in the family with documentation provided to the instructor directly by the student (as opposed to indirectly through University Affairs). It is not possible to make up some missed labs and assignments that depend on field trips, class participation, and materials that are on display temporarily. If such activities are missed due to an excused absence, a writing assignment may be assigned to make up the missed material.

Lecture attendance — Attendance will be taken routinely at the beginning of class. You may miss two lectures without penalty during each interval between exams. Each absence after the second one will lower the participation grade by 20%. Perfect attendance, timeliness, and good behavior for both lab and lecture will result in bonus points on exams. If an unusual and excusable situation causes excessive absences to accrue (e.g., hospital stay), discuss the situation with the instructor and request additional excused absences.

Exam and laboratory attendance — Attendance for labs and exams is crucial, and absences will be handled on a case-by-case basis. Unless extraordinary circumstances are involved, a request for an excused lab or exam absence and makeup work must be made within two business days of the missed event. Unexcused absences from lab will result in loss of quiz and/or assignment points.

Tardiness and classroom conduct — Don’t be late. Each instance of tardiness after the second one during intervals between exams will lower the participation grade by 10%. Poor behavior (e.g., private conversations during lecture, texting etc.) will result in loss of participation points and/or expulsion from class.

Field trips: During lab we will often take excursions on or off campus. On such days you should dress appropriately. For certain labs I will strongly encourage or require you to wear closed-toed shoes (no flip-flops or sandals), a hat, and pants rather than shorts. You may also want sunscreen, insect repellent, and a water bottle.

ACCEPTABLE STUDENT BEHAVIOR: Classroom behavior should not interfere with the instructor’s ability to conduct the class or the ability of other students to learn from the instructional program (see the Student Conduct Code, policy D-34.1). Unacceptable or disruptive behavior will not be tolerated. Students who disrupt the learning environment may be asked to leave class and may be subject to judicial, academic or other penalties. The instructor shall have full discretion over what behavior is appropriate/inappropriate in the classroom.

Please do not carry on a separate conversation that might be distracting to other students. Keep cell phones silenced and stowed away. Texting or any use of phones may result in loss of attendance points and further reduction of one’s grade. Students arriving late or leaving early may be marked absent.

ACADEMIC INTEGRITY: Academic integrity is expected of everyone in this course. Any form of academic dishonesty will lead to the student receiving a failing grade for the entire course. Additionally, a Report of Academic Dishonesty form will be submitted to your Dean’s office.

SFA Policy A-9.1 is summarized as follows: Academic integrity is a responsibility of all university faculty and students. Faculty members promote academic integrity in multiple ways including instruction on the components of academic honesty, as well as abiding by university policy on penalties for cheating and plagiarism. Definition of Academic Dishonesty: Academic dishonesty includes both cheating and plagiarism. Cheating includes but is not limited to (1) using or attempting to use unauthorized materials to aid in achieving a better grade on a component of a class; (2) the falsification or invention of any information, including citations, on an assigned exercise; and/or (3) helping or attempting to help another in an act of cheating or plagiarism. Plagiarism is presenting the words or ideas of another person as if they were your own. Examples of plagiarism are (1) submitting an assignment as if it were one’s own work when, in fact, it is at least partly the work of another; (2) submitting a work that has been purchased or otherwise obtained from an Internet source or another source; and (3) incorporating the words or ideas of an author into one’s paper without giving the author due credit. Please read the complete policy at http://www.sfasu.edu/policies/academic_integrity.asp
WITHHELD GRADES (Semester Grades Policy A-54): Ordinarily, at the discretion of the instructor of record and with the approval of the academic chair/director, a grade of WH will be assigned only if the student cannot complete the course work because of unavoidable circumstances. Students must complete the work within one calendar year from the end of the semester in which they receive a WH, or the grade automatically becomes an F. If students register for the same course in future terms the WH will automatically become an F and will be counted as a repeated course for the purpose of computing the grade point average. The circumstances precipitating the request must have occurred after the last day in which a student could withdraw from a course. Students requesting a WH must be passing the course with a minimum projected grade of C.

STUDENTS WITH DISABILITIES: To obtain disability related accommodations, alternate formats and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, Room 325, 468-3004/468-1004 (TDD), as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided. Failure to request services in a timely manner may delay your accommodation. For additional information, go to http://www.sfasu.edu/disabilityservices/. Please note that you must visit with me outside of class time concerning your request before I will be able to provide the accommodations described in the notification from ODS.
TENTATIVE COURSE CALENDAR — VERSION 1  
* Current version posted on D2L

<table>
<thead>
<tr>
<th>WEEK/DAY</th>
<th>SCHEDULE OF TOPICS</th>
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| 1: Aug 27, 29 | **Lecture:** course intro, importance of invertebrates; nature of science; biology fundamentals (CO 1)  
**Lab:** No lab first week |
| 2: Sept 3, 5 | **Lecture:** evolutionary trees, animal diversity (CO 1)  
**Lab:** lab intro; microscopy exercises; dichotomous key; classification (indoors) (CO 1, 2, 4; assignment 2) |
| 3: Sept 10, 12 | **Lecture:** insect biology and diversity overview (Evans pp. 23-29) (CO 1)  
**Lab:** evolutionary trees and classification exercises (indoors) (CO 1, 4; assignment 1) |
| 4: Sept 17, 19 | **Lecture:** insect diversity cont. (Evans pp. 23-29); Review  
**Lab:** Terrestrial invertebrate survey (outdoors) (CO 1; assignment 5) |
| 5: Sept 24, 26 | **Lecture:** **Exam I Sept 24**; Herbivorous invertebrates (CO 1)  
**Lab:** Herbivores diversity (indoors) (CO 1; assignment 5) |
| 6: Oct 1, 3 | **Lecture:** Scientific literature and database searching assignment (COs 1, 2)  
**Lab:** Herbivores diversity (outdoors) (CO 1, 4; assignment 4) |
| 7: Oct 8, 10 | **Lecture:** Pollinators (CO 1)  
**Lab:** Literature assignment (indoors) (COs 1, 2; assignment 3) |
| 8: Oct 15, 17 | **Lecture:** freshwater aquatic invertebrates (CO 1)  
**Lab:** Freshwater aquatic invertebrates (outdoors) (CO 1, 4; assignment 5) |
| 9: Oct 22, 24 | **Lecture:** freshwater aquatic invertebrates; predators (CO 1)  
**Lab:** Scientific literature, communication, and presentation development (indoors) (COs 1, 2; assignment 6) |
| 10: Oct 29, 31 | **Lecture:** predators, mimicry; parasitoids (CO 1)  
**Lab:** Diversity review (indoors) (CO 1) |
| 11: Nov 5, 7 | **Lecture:** **Exam II Nov. 5**; Parasites and medical issues (CO 1)  
**Lab:** diet analysis: data gathering and analysis lab (indoors) (CO 1, 3, 4) |
| 12: Nov 12, 14 | **Lecture:** scavengers, soil invertebrates, nutrient cycling and forensic applications; home and garden invertebrates (CO 1)  
**Lab:** animal behavior: data gathering and analysis (indoors) (CO 1, 3, 4; assignment 3) |
| 13: Nov 19, 21 | **Lecture:** marine invertebrates (CO 1)  
**Lab:** Scientific communication lab; presentations peer review (COs 1, 2) |
| 14: Dec 3, 5 | **Lecture:** student presentations (COs 1, 2; assignment 6)  
**Lab:** Diversity review (CO 1) |

*Final exam: Tuesday, Dec 10, 10:45-1:15 (*Check your schedule for conflicts!*)
During spring semesters of odd years, the following applies to this class:

By enrolling in BIO 225 you are also enrolling in a core curriculum course that fulfills the Empirical and Quantitative (CO3) requirement. You will see this course on your D2L list. At one point during the semester, you will receive an assignment that fulfills both the requirements of this course and the needs of Stephen F. Austin State University’s Core Curriculum Assessment Plan with the Texas Higher Education Coordinating Board. When you complete this one assignment, you need to upload the assignment to both your standard course dropbox determined by your Instructor and the “Core Curriculum” dropbox. The Core Curriculum dropbox will be identified by the Objective for which work is being collected. (Examples: Critical Thinking, Teamwork, Social Responsibility, Empirical & Quantitative Skills, Personal Responsibility, Communication Skills - Written, Communication Skills - Written & Visual, and Communication Skills - Oral & Visual.) Please note that this only applies to the approved assignment. All other assignments should be submitted according to regular class operations. When you complete the assignment mentioned above, you will upload the assignment to both the BIO 225 dropbox and the Empirical and Quantitative (CO3) dropbox. Please note that this only applies to the specific assignment listed in the matrix below. All other assignments should be submitted according to regular class operations. If you have any questions, please see your instructor, or contact the Office of Student Learning and Institutional Assessment at (936) 468-1130.

The chart below indicates the core objectives addressed by this course, the assignment(s) that will be used to assess the objectives in this course and uploaded to the D2L Teamwork dropbox this semester, and the date the assignment(s) should be uploaded to the D2L Teamwork dropbox. Not every assignment will be submitted for core assessment every semester. Your instructor will notify you which assignment(s) must be submitted for assessment in the D2L Teamwork dropbox.

<table>
<thead>
<tr>
<th>Core Objective</th>
<th>Definition</th>
<th>Course Assignment Title</th>
<th>Date Due in D2L</th>
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<tbody>
<tr>
<td>Empirical and Quantitative</td>
<td>manipulation and analysis of numerical data or observable facts resulting in informed conclusions</td>
<td>Lecture Project TBA</td>
<td>TBA</td>
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</tbody>
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General Education Core Curriculum Objectives/Outcomes (COs):

CO 1. Critical thinking: to include creative thinking, innovation, inquiry, and analysis, evaluation, and synthesis of information. (SLOs 1–7)
CO 2. Communication skills: to include effective development, interpretation, and expression of ideas through written and visual communication. (SLOs 3, 5, 7)
CO 3. Empirical and quantitative skills: to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions. (SLOs 2, 4, 7)
CO 4. Teamwork: to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal. (SLO 8)

Student Learning Outcomes (SLOs):

SLO 1. Develop ability to identify and describe local habitat types. (CO1)
SLO 2. Develop ability to use technical keys and field guides to identify organisms on the basis of measurements and observations using appropriate equipment. (COs 1, 3)
SLO 3. Develop ability to communicate the ecological roles of selected organisms and their significance to mankind in written and visual form. (COs 1, 2)
SLO 4. Develop an understanding of the relationship between form and function. (COs 1, 3)
SLO 5. Become acquainted with current approaches to biological classification and the major lineages of organisms covered and able to express this understanding in written and visual form.
SLO 6. Develop familiarity with methods of biological collections and their importance to society. (CO 1)
SLO 7. Develop ability to understand and generate graphs, charts, summary statistics, & scientific illustrations. (COs 1, 3)
SLO 8. Develop teamwork skills by working in groups to complete lab exercises, conduct fieldwork, make identifications, and resolve differences. (CO 4)

Biology Program Learning Outcomes (PLOs):

PLO 1. The student will demonstrate a good knowledge base in biological concepts. This PLO is achieved with each of the SLOs listed above.
PLO 3. Clearly articulate scientific information in written form. This PLO is achieved with SLO 1, 3, and 5.
PLO 5. Demonstrate teamwork skills. This PLO is achieved with SLO 8.
I. Systematics, Taxonomy, and the Scientific Method
❖ COs 1–4: critical thinking, empirical skills, teamwork, visual communication

Students will develop an understanding of the scientific method within the context of the practice of biological classification. They will learn fundamental concepts regarding how organisms are named, assigned to categories, and how these actions represent hypotheses that can be tested. Furthermore, they will discover how hypotheses of evolutionary relationship are generated and visually expressed using evolutionary tree diagrams. These topics will be introduced with lectures and reinforced with readings and lab activities. In the latter, students will devise their own classifications and evolutionary trees, activities which require thoughtful observation (CO 3), application of the logic involved in assigning organisms to hierarchical categories (CO 1), and an understanding of, hypotheses and associated information can be contained in visual diagrams (CO 1, 2).

Assignment 1: Organizing the diversity of life: scientific method, classifications & phylogenies
Students will be presented with an array of preserved organisms (plants, shells, pinned insects, etc.) or models of hypothetical organisms. Working in teams (CO 4), students will be required to devise names, group individuals in a hierarchical classification (CO 1), and present an evolutionary tree that visually communicates hypotheses of evolutionary relationships (CO 2). Students will be required to justify their classifications (CO 1, 2), defend their hypotheses (CO 1, 2), and test them with new data (discovery of a fossil and/or new species) (CO 1). Successful completion of activities will demonstrate an understanding of concepts regarding evolutionary trees, biological classification, and crucial aspects of the scientific method including distinctions between observation, question, fact, hypothesis, hypothesis test, and conclusion.

II. Identification of Organisms, Population Characterization and Exploration of their Behavior and/or Growth Patterns
❖ COs 1–4: critical thinking, empirical and quantitative skills, visual communication, teamwork

Students will learn to recognize selected organisms and natural habitats of East Texas. Concepts will be introduced in lectures and skills will be further developed through lab activities, field trips, and activities emphasizing the use of dichotomous keys. Successful outcomes using keys requires cooperation (CO 4), a command of specialized vocabulary (CO 1), an understanding of anatomy (CO 1), skill in taking, storing and summarizing measurements (CO 3), and thoughtful, precise decision making (CO 1).

Assignment 2: Identifications using dichotomous keys
Working in teams, students will compete to identify unknown organisms using technical, dichotomous keys and in so doing demonstrate an understanding of the hierarchical nature of classification, specialized terminology, and anatomy (CO 1). Team members will be required to submit the same answers, thus students will have to resolve differences of opinion (CO 4). Students will correct misidentifications and document how locating mistakes in an identification pathway results in learning (CO 1).

Assignment 3: Animal behavior
Working in teams, students will explore aspects of captive invertebrates such as crickets or branchiopods. Quantitative data will be acquired and synthesized to provide meaningful learning on the behavior of the subjects at hand. This will develop skills in data acquisition and analysis (COs 1-4).
III. Scientific Communication
❖ CO 2: Written and visual communication

The ways in which scientists communicate will be emphasized by exposure to topics such as primary literature, peer review, academic conferences, and scientific illustration (CO 2). Students will demonstrate communication skills by keeping a field notebook, performing at least one writing assignment, and preparing a photographic portfolio of habitats and organisms encountered on field trips (CO2), and

Assignment 4: Literature research and review writing assignment
Students will prepare an article on a selected habitat, organism, or higher-level taxon that demonstrates exploration of the scientific literature, communication abilities, and appropriate use of grammar, style and terminology. (CO 1, 2)

Assignment 5: Lab report and photographic portfolio
Students will prepare multiple installments of a lab report that includes a photographic portfolio of habitats, selected organisms, and their diagnostic structures. Images will be accompanied by appropriate labels and descriptions that demonstrate an understanding of terminology, anatomy, and conventions of scientific illustration. (CO 1, 2)

Assignment 6: Presentation
Students will prepare a short oral presentation on a species of marine invertebrate. Content delivered will include summaries of primary literature gathered through guided exercises that develop skills in using scientific literature databases. (CO 1, 2)