Instructor: Dr. Donald B. Pratt  
Department of Biology  
111 Miller Science  
468-2038; prattdb@sfasu.edu

Text and Materials: 30x magnification hand lens  
2 needle nose tweezers/forceps purchased from a biological supplier such as http://www.bioquip.com/search/DispProduct.asp?pid=4531  
A GPS Location App  
A Smartphone Photo Time Stamp App such as TimeStampIt

Meeting Time: TR 5:00-6:15 PM, 119 Miller Science

Office Hours: MWF 10:00-10:50 AM  
TR 2:00-3:00 PM  
or by appointment

Course Description: Practical experience in bryophyte collections-based research techniques in both the field and laboratory settings. Students will collect, key, identify, and prepare bryophyte specimens. They will collect and analyze basic ecological data including percent coverage and species diversity. Students will communicate scientific information in an oral presentation.

Program Learning Outcomes:  
Each course objective and student learning outcome listed below corresponds to the Biology  
- Department PLO 1 to develop knowledge of biological concepts.  
- Department PLO 2 to clearly communicate scientific information.  
- Department PLO 3 to think scientifically including critical thinking/reasoning, explaining biological principles, and analyzing and interpreting quantitative data sets

Student Learning Outcomes (Course Competencies):  
The final grade includes both lecture and lab-based components. However, the lecture and lab components each encompass separate course competencies.  
- Students will use field techniques discussed in lecture (PLO 1) to collect, key, identify, and prepare bryophyte specimens incorporating their scientific observations (PLO 3)  
- Students will communicate scientific information about a bryophyte species verbally in the form of an oral presentation (PLO 2)  
- Students will collect and statistically analyze ecological data to determine percent coverage and species diversity of bryophytes on trees by intercardinal aspect (NE, SE, SW, NW) at breast height (PLO 3)
Grades:

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Points</th>
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<tr>
<td>Hours- Sixty-five project hours</td>
<td>100 pts</td>
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<tr>
<td>Vocabulary Test</td>
<td>50 pts</td>
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<tr>
<td>Ten bryophyte collections</td>
<td>100 pts</td>
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<tr>
<td>Bryophyte Species Diversity Analysis</td>
<td>50 pts</td>
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<tr>
<td>Oral Presentation</td>
<td>100 pts</td>
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Assignments

- **Hours** - You are required to document the time you spend on your projects. Any time spent collecting, in the lab identifying your collections, analyzing data, preparing the Species Diversity report, or working on your presentation counts towards your required hours. You will submit a schedule of your hours at the end of the semester. Project hours should be made up on your own time. I will open the lab at your request and will be available for help provided I am not in lecture. Note that sixty-five hours spread out across fifteen weeks means you should spend an average of 4.3 hours PER WEEK on projects OUTSIDE of lecture time. Identifying bryophytes accurately is tricky and past data indicates that it takes an average of 5 hours to identify a specimen! You MUST be self-disciplined and put consistent time in to this class in order to do well. You CANNOT expect to do your IDs and make up your hours the week before specimens are due.

- **Vocabulary Test** - You have been given a list of vocabulary terminology for the Bryophytes. Definitions of these terms will be given during lecture hours. On the test you will be required to know definitions AND be able to apply the term to the appropriate groups.

- **Collections** - You are required to submit ten specimens representing **eight** different species. No more than two specimens of a previously collected species may be submitted for points. The duplicate species must be collected from different places- you cannot simply split a collection into two! Nor can you count four specimens of a species. **Collections must be made individually.** Points will be split between students turning in substantially similar specimen sets. Your collections will be graded based on accuracy of the identification and quality of the collections data provided in the specimen label. You must include a date-stamped **in situ** photo of each specimen using an app such as TimeStampIt.
  - Due dates
    - The first five due March 14
    - The remaining five due May 2
  - Submissions must include
    - An air-dried sample with as much soil debris removed as possible placed in the packet
    - The packet must be printed on archival paper (sheets provided) and include all data label elements
- A PowerPoint file to be placed in the appropriate D2L Dropbox for each specimen including the packet label on one page and a time-stamped, \textit{in situ} photo of the specimen on the second page.

- **Bryophyte Diversity Analysis:** As part of your experience you will work in pairs to gather and analyze ecological data. Each pair will be given a randomly selected Sweetgum tree (\textit{Liquidambar styraciflua}) in Hunt's Woods across University Drive from the Azalea Gardens. Each pair of students will gather percent coverage data using a 5 cm\(^2\) quadrat and collect a sample from the four intercardinal directions (NE, SE, SW, NW). Students will work in pairs to identify all specimens within each sample and follow a metric to determine the relative abundance of each species in each quadrat. Percent coverage by intercardinal direction and species abundance by each quadrat data will be provided to assemble a data set representing the entire class. Students will work individually to analyze the data set to detect statistically significant patterns of percent abundance, Shannon’s Diversity Index, and Pielou’s Evenness by each intercardinal direction. Results will be presented in a Dropbox.

- **Oral Presentation**- You will give a ten minute oral presentation about one of the species you collected. Each student must select a different species for the presentation on a first-come-first-served basis. The presentation must be in PowerPoint format and cover the following concepts:
  - **Taxonomic information:** This is a section containing relevant taxonomic information including the division, class, family, and name of the species (with the authority).
  - **Key features:** Describe the key features of the species you have chosen. \textbf{This section needs to include photographs of the diagnostic features TAKEN BY YOU.} Students using uncredited photos downloaded from the web will have 50 points deducted from their presentation. You may use photos or diagrams from other sources IF the additional images accompany your original photos AND you provide the source of the images. Twenty points will be deducted if you provide images in addition to your own photos but fail to include the source of the images.
  - **Distribution:** This section describing the distribution of the species in the United States and Texas. You should go to the following website http://bryophyteportal.org/portal/ and search for your species. You must provide maps for this section. One map must be of the distribution of the species within the United States, the second map must be of the distribution of the species within Texas by county. Again, the maps MUST be your own original work. You will be penalized 50 points for using uncredited sources and ten points for using other, credited sources.
  - **Substrate and Habitat:** Include a section describing the habitat and substrate where this species can be found. You should be as specific as possible and **you must include in situ photos of your species.** Substrate and habitat data may come from your personal collections, collections of the species by classmates, information on herbarium packets (either from the SFA herbarium OR bryoportal), or the scientific literature.
  - **Works Cited:** In this section make a list of all the literature and websites you used.
The presentation will be graded as follows
- 50 points content (the sections required above)
- 5 points timing (9.5-10.5)
- 5 points power point formatting
- 10 points graphics
- 10 points for eye contact
- 10 points for verbal expression
- 10 points for lack of annoying mannerisms

Disabilities Statement:
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, and 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 accommodations. For additional information, go to http://www.sfasu.edu/disabilityservices/.

Academic Integrity (University Policy A-9.1 Statement):
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
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<th>Lecture Topic</th>
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<td>5 Bryophyte Specimens</td>
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