**PCB 4460 Treetop Biodiversity**
Spring 2020 Semester of Immersion

**Co-instructors**


| Dr. Christine Davis | Dr. Norm Douglas | Mr. Danny Lyons (climbing) |
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**Learning objectives**

By the end of this course, you will be able to:

1) Form and test hypotheses about comparative epiphyte biodiversity.
2) Design a sampling plan to gather data to test hypotheses.
3) Document observations and techniques in a field notebook.
4) Identify epiphytic vascular and non-vascular plants using keys.
5) Compile and analyze collection data to evaluate hypotheses.
6) Collaborate to co-author a scientific paper on your findings.
7) Prepare voucher specimens for submission to herbaria.
8) Climb trees using ropes and harnesses.

**Course description**

The forest canopy, especially in tropical and subtropical regions, hosts a rich diversity of life. Epiphytic vascular plants (those growing among the branches of larger plants, such as trees) may represent as much as 10% of all plant species on Earth, and non-vascular plants are abundant in the moist and shaded regions of the treetops. Botanists have only begun to catalog canopy diversity in the last few decades, since collection methods have become safer and easier to use. After a literature review and discussion of hypotheses, we'll design our own sampling schemes, then visit three sites to survey canopy botanical diversity. Each field trip will be followed by laboratory time to identify and produce voucher specimens of the plants we collect.

| **Grading** | Points |
|---|---|
| Field notebook/data checks (3 @ 5 points each) | 15 |
| Weekly paper collaborations (5 @ 10 points each) | 50 |
| Voucher specimens | 25 |
| Slide show | 10 |
| TOTAL | 100 |

**Description of assignments**

*Field notebook/data checks*: When we are at a site and in a tree collecting, there will be many observations you'll need to record. Some examples include: location, habitat, and species of tree we are climbing and other trees in the community; size of climbing tree; weather conditions; drawings of transect; group member tasks and responsibilities; photos taken in the tree and on the ground; notes about pollinators and other organisms in the canopy; number of plants collected or photographed (and any other information that may be important later).

*Weekly paper collaborations:* A major product of this class will be a manuscript in the format of a scientific journal article. Each student is expected to contribute to this paper. To facilitate this, at five class meetings, we will have paper collaboration sessions. During these sessions, students are expected to work together to rewrite, edit, proofread, and format the manuscript. At each session, the goal will be to complete a draft of one section of the final paper. This will require planning so that each person has their contribution ready to add prior to the collaboration session.

For example, as discussions happen about questions, hypotheses, and methods, text should be added to a collaborative document. As results are tabulated and analyses performed, these should be added to the document. As figures are prepared, they should also be added. As interpretations of the results are made through discussion among students, these should be recorded. Continuous and thoughtful contributions by each student will ensure that the group product is of high quality. It will be necessary to make successive edits as the project progresses to produce a coherent paper.

*Final slide show:* As a group we will collate photographic documentation of each species we find into a single slide show. Photos should document each species as completely as possible (including habit & habitat & important characters for identification, along with voucher info for each photo). Use the highest quality photos of each species!

*Vouchers*: This is a finished set of your specimens and complete label data, ready to submit to herbaria. We'll provide details of what a label should include and how to collect a good voucher specimen during the first week of class.

**Course materials**

Please purchase a bound (not loose-leaf or spiral-bound) composition notebook to serve as your field notebook. All reading materials, identification texts, climbing equipment, and most collecting equipment will be provided by the co-instructors. However, you may wish to also purchase or bring the following items for your personal use in the class:

Pocket knife
Small pruners/plant clippers
Sharpie marker
Camera (cell phone camera is fine)

**Tentative schedule**

Monday, Jan 6 - introductions; initial goals and questions
Tuesday, Jan 7 - exploratory field trip
Wednesday, Jan 8 - discuss ideas and identify focal projects
Thursday, Jan 9 - exploratory field trip - honing in on focal projects. *Literature search assigned - due Friday.*
Friday, Jan 10 - <u>First paper collaboration - Goals and questions.</u> *Reading assigned - due Monday.*

Monday, Jan 13 - Discussion of assigned reading. Prepare for field collecting. *Assignment - contribute to background portion of paper - due Wednesday.*

**Tuesday, Jan 14 - Field collecting - Gum Root Park**

Wednesday, Jan 15 - Second paper collaboration - Background. Process collections. Prepare for climb.

**Thursday, Jan 16 - Climb 1 - Gum Root Park**

Friday, Jan 17 - Specimen identification. *Assignment - contribute to materials and methods portion of paper - due Tuesday.*

**Saturday, Jan 18 - Field collecting - Otter Springs**

**Sunday, Jan 19 - Climb 2 - Otter Springs**

Monday, Jan 20 - No class - MLK day

Tuesday, Jan 21 - Third paper collaboration - Materials and Methods. *Literature search assigned - due Wednesday.*

Wednesday, Jan 22 - Specimen identification. *Reading assigned - due Thursday.*

Thursday, Jan 23 - Discussion of assigned reading. Specimen identification.

Friday, Jan 24 - Specimen identification.

Monday, Jan 27 - Specimen identification. Prepare for field collecting and climb. *Assignment - contribute to species list and results portion of paper (first two collecting/climbing sites) - due Friday.*

**Tuesday, Jan 28 - Field collecting - Palm Point Park**

**Wednesday, Jan 29 - Climb 2 - Palm Point Park**

Thursday, Jan 30 - Specimen identification.

Friday, Jan 31 - Fourth paper collaboration - Results. Specimen identification.

Monday, Feb 3 - Specimen identification.

Tuesday, Feb 4 - Specimen identification. *Assignment - contribute to species list and results portion of paper (last collecting/climbing site) and discussion/conclusion - due Thursday.*

Wednesday, Feb 5 - Specimen identification.

Thursday, Feb 6 - Fifth paper collaboration - Results, Discussion and Conclusions

Friday, Feb 7 - Slide show presentation; vouchers due