

## Phylogenetic Comparative Methods

Instructors Cécile Ané, Anthony Ives, Bret Larget  
Time and place Tuesdays 4-4:50 pm in 350 Birge  
Course Website <http://www.stat.wisc.edu/~larget/botany940/>  
Class list email [zoology956-1-s11@lists.wisc.edu](mailto:zoology956-1-s11@lists.wisc.edu)

- **Course Structure.** Most of this seminar will be tutorial-oriented, based on case studies proposed by students and selected through a competition by all course participants. Three of the proposed case studies will be selected for in-depth analysis during the semester. Reading selections will be motivated by questions arising from these case studies. We will cover a wide array of currently-used methods, and address practical issues in the analysis of real comparative data. The first few weeks will be lecture-based, in order to provide the basic framework for data modeling and analysis during the rest of the semester.
- **Student Participation.** Students will need to:
  1. Provide a case study to enter the competition. This includes finding a suitable and available data set and presenting to the class a brief description of the biological questions of interest and variables included in the data set.
  2. Lead discussion at least once. With assistance from the instructors, select one or more papers to be read and discussed.
  3. Spend about one hour reading and thinking about each selected paper prior to class; send one or more questions about the papers to the instructors and student discussion leader at least 24 hours before class time.
  4. When applicable, use software introduced in class to carry out analysis of data from case studies in preparation for class discussion.
  5. Attend class well prepared and participate in discussions.
- **Grading.** Grades will be determined based on the student's performance during the week s/he leads discussion (50%), and on the student's participation/questions in weeks when discussion is led by others (50%). Instructors will provide feedback to the students shortly after their presentations.
- **Tentative Schedule.**
  - 1/18 Introduction, Survey and Brainstorming
  - 1/25 Lecture 1: Comparative Methods from a biologist's point of view
  - 2/ 1 Lecture 2: Comparative Methods from a statistician's point of view
  - 2/ 8 Lecture 3: Tree and divergence time estimation for comparative methods
  - 2/15 Case Studies Competition and selection of three complementary case studies
  - 2/22 Case Study #1, part 1
  - 3/ 1 Case Study #1, part 2
  - 3/ 8 Case Study #1, part 3
  - 3/15 Spring recess
  - 3/22 Case Study #2, part 1
  - 3/29 Case Study #2, part 2
  - 4/ 5 Case Study #2, part 3
  - 4/12 Case Study #3, part 1
  - 4/19 Case Study #3, part 2
  - 4/26 Case Study #3, part 3
  - 5/ 3 Wrap-up