Community Ecology Lab Syllabus – Spring 2026 **v. 01.13.2026**

BIOL 4052/5052; 1 SCH (must be co-enrolled in 4051 or 5051)

Meeting place & time: GAB 550
Section 501: W 9:00am – 11:50am
Section 503: F 12:00pm – 2:50pm

Instructors:
Dr. Ana Hoeinghaus; AnaPaula.Hoeinghaus@unt.edu
Office hours: By appointment
Dr. David Hoeinghaus; David.Hoeinghaus@unt.edu
Office hours: By appointment

Teaching assistants:
Ms. Sophie Davis; SophiaDavis@my.unt.edu
Office hours: By appointment.
Mr. Michael Curtis; MichaelCurtis3@my.unt.edu
Office hours: By appointment.

Description: This lab will reinforce lecture by providing hands-on experience with indices, models, multivariate analyses and other analytical approaches frequently used in ecological research. Lab meetings will explore specific analytical approaches that accompany each topic from lecture. All assignments will use the open-source statistical language *R*, and students will gain sufficient competence with R to upload and manipulate data, generate data summaries and indices, evaluate model performance, and conduct common statistical analyses. Besides providing an important 'tool kit' of approaches useful in your technical training, the focus on interpreting outcomes of ecological models and analyses should enable students to better understand published ecological research.

Prerequisites: Biology Foundation requirements, including Ecology

Required texts: Borcard, D., F. Gillet & P. Legendre. 2018. Numerical Ecology with R, 2nd edition. Springer [Note: This book is available as a PDF from the publisher. See Canvas for a link to download, or you can purchase a physical copy from the bookstore.]

Other recommended software and materials: We have computers available in the lab (GAB 550) but you may prefer additional access to the software outside of lab meeting times. Laptop/computer compatible with R software (free to download). First, download the most recent version of the R software from this link (https://cloud.r- project.org/) for your operating system (i.e. Windows, Mac, Linux). Once R is downloaded on your laptop/computer, then download the most recent version of the (free) RStudio Desktop software from this link (https://rstudio.com/products/rstudio/download/) for your operating system at the bottom of the page.

Course structure: The course is taught in person. We expect this class to be highly interactive and engaging. Lab meetings will explore analytical approaches that accompany each topic. We will cover a large amount of material very quickly, and your success at later stages of the course will depend on developing a strong foundation early on. This course is taught at an advanced level. That being said, we recognize that students will have various levels of experience and we will make the information as easily accessible as possible. Please contact your TA by email or via Canvas if you are struggling with the material and/or course structure – we are happy to help you achieve the best possible outcome, but we cannot help you if you only reach out at the end of the semester.

Canvas: Get familiar with Canvas – it is the portal through which primary course communication will take place, materials will be disseminated and assignments submitted. Check Canvas regularly for course updates. *Students are responsible for checking for announcements*; we recommend that you select notifications 'on' in your Canvas settings.

Grading: Lecture and lab grades are reported separately. Lab grades are based on performance on weekly lab assignments plus a term project for graduate students. Attendance is mandatory – plan to arrive on time and to stay for the entire lab meeting time. Short quizzes will be completed at the beginning of lab during most weeks, and each weekly lab assignment will be completed and submitted at the end of the session. There will be 14 weekly assignments during the semester, with each week worth 20 points total (quiz + assignment), with the lowest weekly total dropped, resulting in a total of 260 possible points. In addition to the weekly activities, graduate students will complete a term project worth 80 points during the second half of the semester to test hypotheses using a provided dataset. Letter-grades will be calculated based on percentage of possible points attained (260 for undergraduate students and 340 for graduate students), with A = 90-100%, B = 80-89%, C = 70-79%, D = 60-69%, and F = below 60%.

Other: All College of Science computer labs have R and RStudio available to use (GAB 330, GAB 550). If you do not have a computer, laptops are available for students to checkout at Willis Library. Mobile hotspot devices, for students who need internet connectivity, are also available for checkout. You can make a request at Lib.Support@unt.edu. If you have any technical difficulties with UNT information technology please contact UIT (https://it.unt.edu/helpdesk).

Incomplete and drop: An incomplete (I) grade is given only during the last one-fourth of a semester and only if a student is: (1) passing the course; (2) has a justifiable reason why the class cannot be completed on schedule; and (3) arranges with the instructor to finish the course at a later date. All work must be completed within the time specified by the instructor (not to exceed one year after taking the course). The first day to request a grade of 'Incomplete' is April 11. The last day to drop the course with a grade of 'W' is April 10.

Attendance: Attendance is required. Unexcused absences will result in a zero for that day's assignments. See the university attendance policy for specifications on unexcused and excused absences. In the event of an university excused absence, an alternate assignment will be provided.

ADA Policy: The University of North Texas complies with the Americans with Disabilities Act of1990 in making reasonable accommodation for qualified students with disabilities. If you have a qualifying disability as defined in the ADA and would like to request accommodation, please contact the Office of Disability Accommodation at (940) 565-4323. You may request accommodations at any time, however, ODA notices of accommodation should be provided as early as possible in the semester to avoid any delay in implementation. For additional information see the Office of Disability Accommodation website at http://www.unt.edu/oda.

Academic integrity: According to UNT Policy 06.003 on Student Academic Integrity, academic dishonesty occurs when students engage in behaviors including, but not limited to cheating, fabrication, facilitating academic dishonesty, forgery, plagiarism, and sabotage. A finding of academic dishonesty may result in a range of academic penalties or sanctions ranging from admonition to expulsion from the University. Visit University of North Texas' Student Academic Integrity Policy: https://policy.unt.edu/policy/06-003 to obtain additional information and refer to the Student Code of Conduct and the Office of Students' Rights and Responsibilities (http://www.unt.edu/csrr) for information on how any cases of academic dishonesty will be handled.

TENTATIVE SCHEDULE

Week 1 (Jan 14/16): Welcome
Data literacy, and a very brief intro to R

Week 2 (Jan 21/23): Exploring Community Data
Intro to R, start learning the basics,
"R for Ecologists"; read Ch. 1 in BGL

Week 3 (Jan 28/30): Quantifying Diversity
Rank-abundance curves, diversity indices, and community diversity
Ch. 2, 8.1-8.4.2 in BGL

Week 4 (Feb 4/6): Population Models
Population modeling; excerpts from Ch. 1-3 in Stevens

Week 5 (Feb 11/13): Predator-prey
Enemy-victim models; Ch. 6 from Stevens

Week 6 (Feb 18/20): Competition
Competition models; Ch. 9 in Stevens

Week 7 (Feb 25/27): Associations and Community Structure
Association measures and matrices, and cluster analyses; Ch. 3 in BGL

Week 8 (Mar 4/6): Unconstrained Ordination
Unconstrained ordination; Ch. 5 in BGL

Week 9 (Mar 11/13): *No class; Spring Break*

Week 10 (Mar 18/20): Networks
Food webs and bipartite networks; R package *cheddar*

Week 11 (Mar 25/27): Constrained Ordination
Constrained ordination; Ch. 6 in BGL

Week 12 (Apr 1/3): Integrating Species Traits
Trait-based approaches, RLQ and 4th corner analyses; Ch. 6.11 in BGL

Week 13 (Apr 8/10): Metacommunity Structure
Metacommunity structure analysis; R package *metacom*

Week 14 (Apr 15/17): Dimensions of Diversity
Spatial, phylogenetic and functional diversity; Ch. 8.3-8.6 BGL

Week 15 (Apr 22/24): Evolutionary Community Ecology
Integrating phylogenetic relationships in community ecology; R package *picante*

Week 16 (Apr 29/May 1): *No class – Pre-finals and Reading days*