
Instructor: Dr. Kimberly L. Kanapeckas
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Lecture: NA

Office hours: By email appointment. If I'm not in my office, please check the lab.

Recommended Texts:

An Introduction to Population Genetics: Theory and Applications by Rasmus Nielsen & Montgomery Slatkin.
A Short Guide to Writing about Biology, 9th edition by Jan A. Pechenik.

Course Description: An independent-study course for graduate students focused on the analysis and interpretation of genetic variation in natural populations. The student will learn to test basic models that connect genetic variation to underlying evolutionary and genetic processes, including mutation, recombination, genetic drift, migration, and natural selection. The student will guide discussion of methods for measuring DNA variation, including the analysis of genome-scale data sets. Methods may include sequence data analysis, marker selection, DNA barcoding, microarrays and next generation sequencing, selection and demography, and phylogenetics. The overall goal will be to understand how to examine real-world data to determine the best fit model(s) explaining observed genetic and ultimately genomic variation.

Student enrollment limit: 1.

Course Objectives: In this course the student will develop

- ❖ an understanding of contemporary methods of analysis of population-level genetic data;
- ❖ critical thinking skills through independent scientific literature evaluation, discussions, and analysis of datasets; and
- ❖ awareness of how population and conservation genetics impact our natural resources.

Student Learning Objectives: *This course is designed as a self-directed opportunity for the student to apply population genetic approaches as an independent scientist.* It will include a mixture of assigned readings, student-led discussion of current literature in population genetic methods applied to conservation and management with the professor, and independent, direct application of these methods (*i.e.* lab and software experience). Emphasis will be placed on developing scientific writing and oral communication skills through critical evaluation of scholarly literature. This course will offer an opportunity to integrate population genetic and evolutionary thinking into the student's current research and will give perspective for future forays in the field.

Expectations: As you soon will learn, I maintain high standards for my courses. I structure my courses to reward not only the intellectually bright students but also those who are willing to work hard. My philosophy is to instill in my students a good work ethic because I believe that characteristic will serve you well in the work world. I also expect you **to use initiative, to think** about things, and **to remain enthusiastic** about science.

Attendance Policy (2017-2018 College of Charleston Catalog): The faculty believe that class attendance is an integral and vital element in learning. Attendance regulations are determined by the professor teaching the class and are to be stipulated in the syllabus at the beginning of each semester. Faculty are responsible for regulating attendance in their classes subject to the following:

- Excused absences include illness, death in the family, representing the College on official college business, academic field trips, and in season intercollegiate athletic competition. Excused absences must be verified in writing by the appropriate college official within one week. Only **2 (two) unexcused absences are allowed** by the professor in this course.
- Students with an excused absence are responsible for working with the faculty to make up missed work. **No makeup work will be allowed for unexcused absences.** Students with an excused absence who make up missed course work and /or laboratory sessions within a week of the absence will not be penalized.

Application:

- **Attendance is required for all literature and software/analysis discussions.** In the case of excused absences, it is the responsibility of the student to contact me **prior to class by official business email only**, and to provide evidence of the excuse.
- Students with an excused absence will be allowed to make up missed assignments or activities. Students without an excused absence may be allowed to make up missed assignments or activities at the discretion of the professor. All make-up work must be completed within **one week** of the absence to avoid a late penalty.
- Excessive tardiness may result in a reduction in your final class grade. Students will receive a written warning if they are in danger of incurring this penalty.

Honor Code: I expect my students to behave with respect and integrity toward me and their fellow students. The honor code presented by the College sets the standard for this behavior.

Academic Integrity: Violations of the honor code will be reported to the Administrative and Academic Deans and may result in a zero on the assignment and/or failing the class. Students should work personally on their assignments. Each student must **independently** prepare his/her own work to be turned in for a grade. That means that each and every assignment should be **written entirely in your own words**.

Accommodations for Students with Disabilities:

Center for Student Learning: I encourage you to utilize the Center for Student Learning's (CSL) academic support services for assistance in study strategies, speaking and writing strategies, and course content. They offer tutoring, Supplemental Instruction, study strategy appointments, and workshops. Students of all abilities have become more successful using these programs throughout their academic career and the services are available to you at no additional cost. For more information regarding these services, please visit the CSL website at <http://csl.cofc.edu> or call (843)953-5635.

Center for Disability Services (<http://disabilityservices.cofc.edu/for-faculty/faqs.php>)

The College will make reasonable accommodations for persons with documented disabilities. Students should apply for services at the Center for Disability Services/SNAP located on the first floor of the Lightsey Center, Suite 104. Students approved for accommodations are responsible for notifying me as soon as possible and for contacting me one week before accommodation is needed.

Grading Policy: The final grade will be based on the following scale:

A ≥ 90%, B+ ≥ 87%, B ≥ 80%, C+ ≥ 77%, C ≥ 70%, F < 70%.

The procedure for calculating the final grade is as follows:

Participation	10%
Article Critiques	60%
Software Presentation	30%

Participation: As a graduate student, I expect you are self-motivated to learn the material and begin to apply it to your independent research project. You are expected to complete all assigned readings on your own and initiate regular meetings with the professor to discuss methods currently used in population and conservation genetics. Participation means engaging in the material, asking relevant questions, and providing independent insights. Most sessions will follow a one-on-one discussion format (take notes as you read so that you are prepared). The student will work through analysis of data sets independently as preparation for the Software Presentation. Participation will account for 10% of your grade.

Article Critiques: Being a successful scientist requires many skills. Two of the most important skills are the ability to read, comprehend, and evaluate scientific literature and the ability to convey the significance of research being conducted effectively, whether it is your own research or someone else's research. The only way to master these skills is to PRACTICE; therefore, you will be required to evaluate journal articles and to write several papers throughout the semester. **I expect all papers to be 1.5 line-spaced and typed in an 11 point Times font.** One of the suggested textbooks for the course is designed specifically to aid you with your writing assignments. Article critiques will account for 60% of your final grade.

Software Presentation: Many software programs have been developed in the fields of population genetics and molecular evolution. The student will be asked to review, practice, and present the utility and functionality of one of these programs at the end of the term. The specific program will be determined in consultation with me. A list of some of the many softwares you might choose from will be provided by the professor on the first day of meeting. The software presentation will account for the remaining 30% of your final grade.