ISC49../5934 – Inferences in Conservation Genetics

Class Meeting

Lectures: Tuesdays 12:30-1:45, Dirac Science Library Room 152
Lab: Thursdays 12:30-1:45, Dirac Science Library Room 152

Instructor

Peter Beerli, 150-T DSL, beerli@fsu.edu, (850) 645-1324

Office Hours

Tuesday and Thursday after class or by appointment, I have an open door policy.

Objectives

- This course will introduce students to theory, methods, and computer programs used in Conservation Genetics:
- To expose students to the theoretical population genetics involving small populations: Students will learn about genetic drift, population structure, selection in unstructured and structured population, pedigree analysis. Introduce students to analysis methods in conservation genetics.

Content

This course gives an overview of the necessary population genetics theory to execute projects in conservation genetics. In particular the effects of small populations; effects of natural, sexual, and artificial selection on small populations; adaptations to local environments and management of genetic variability in small populations (wild and captive) will be addressed. During the lab sessions students will use probabilistic methods (and computer programs) to analyze genetic data and learn to interpret results, and devise potential actions to manage the conservation units under study.

Textbook

Allendorf, F. W., and G. Luikart 2007. Conservation and the genetics of populations, Blackwell Publishing.

Grading

Grades will be based on students execution of 4 assignments [5 points each] Each student will do a project during the last 7 weeks of the semester and also give a short presentation of their work in the last week of class. [20 written project+10 presentation] We will have a theory test on March 15th (midterm). [10 points]
A student who accumulates 90% or more of the possible points will receive a grade of A, a student who accumulates between 80% and 89% of the possible points will receive a grade of B, a student who accumulates between 70% and 79% of the possible points will receive a grade of C, a student who accumulates between 60% and 69% of the possible points will receive a grade of D, and a student who accumulates less than 60% of the possible points will receive a grade of F.

Attendance

Attendance in class is strongly recommended. While there is no penalty for failure to attend, the instructor may not be able to review with you any material that you miss by nonattendance unless you have a valid reason for absence (illness, death of a family member, professional conflict, subpoena to court, varsity athletics, religious holiday) or make a prior arrangement.

Missed/Late Assignments

Deadlines for assignments will be announced in class; late assignments will be accepted for full grade only in cases of illness or death in the family. 10% of the points are deducted for each day late assignments.

Florida State Honor Code

Students are expected to uphold the Academic Honor Code published in The Florida State University Bulletin and the Student Handbook, The first paragraph says: The Academic Honor System of Florida State University is based on the premise that each student has the responsibility to uphold the highest standards of academic integrity in the students own work.

ADA Policy, Students with disabilities

Students with disabilities needing academic accommodations should: (1) Register with and provide documentation to the Student Disability Resource Center [SDRC]) in room 108 in the Student Services Building (644-9566). (2) Bring me a letter from the SDRC indicating you need academic accommodations. This should be done within the first week of classes. For more information on this see the Resource Centers web site (http://www.disabilitycenter.fsu.edu/index.html). If you need alternative accommodations for any reason, please notify the instructor.

Course overview

1. Basic genetics introduction: Phenotypic variation in natural populations, genetic variation in natural populations: Chromosomes, Proteins, DNA.

2. Population genetics: random mating populations, small populations and genetic drift., effective population size; natural selection, population structure, quantitative genetics (pedigree studies), genetic processes
3. Landscape Genetics: variation of genetic variability with the landscape, correlation between climate/elevation with genetics.
4. Model selection: comparison of population models
5. Forensic and management applications of genetic identification: invasive species.
6. Genetics and Conservation: inbreeding depression, demography and extinction, metapopulations and fragmentation, units of conservation, hybridization, conservation breeding and restoration,

Similarity to other courses on campus

Focus in our class will be computing and algorithms, therefore centering on the ”how” and less on the ”why”. Good preparations for this class are *Ecological Genetics, Conservation Biology, Evolution (grad or undergrad), Population genetics (undergrad), Computational Evolutionary Biology*