WLF 540 Conservation Genetics (online)

Summer 2018, 1-3 credits
Draft April 2, 2018

Instructors:
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Course Description: The application of molecular genetic methods has become increasingly important in the conservation and management of fish, wildlife and plant species. This course is designed to help students learn the basic principles of population genetics and phylogenetics as they are applied in the fields of conservation genetics and conservation genomics. Students will gain an overview of this actively growing field, learn to interpret genetic data and critically review papers from a wide-range of important topics in conservation genetics and genomics.

Course Format: The class is designed as three one-credit modules (introduction to conservation genetics, advanced topics in conservation genetics and conservation genomics) giving students the option to take 1 – 3 credits depending on time and interest. If taking this as a 3 credit course, note that this is a 17 week semester long course that has been condensed into a 12 week summer format so workload will be higher than during a regular semester. If you are taking only 1 or 2 credits, we can develop a more relaxed timeline than provided in the table below if desired.

Course website: BBlearn

Textbook: Conservation and the Genetics of populations 2nd edition. 2013. Allendorf, Luikart, Aitken, Wiley-Blackwell and papers from the primary literature.

Learning Outcomes:
Students will be able to:

1) *Learn and Integrate:* Describe the major aspects of the fields conservation genetics and genomics
2) *Think and Create:* Critically evaluate the conservation genetic literature
3) *Think and Create:* Interpret genetic data and apply findings in a management context
4) *Communicate*- Effectively communicate conservation genetic information in a written and/or oral form

Grading:
Your grade will be based on the following items. 1 credit only – homework assignments (75%) and discussion boards (25%). 2-3 credits – Review paper or class lecture (35%), homework assignments (45%) and discussion boards (20%). Detailed assignments information will be provided on Bblearn.

Class Schedule

Module 1 – Introduction to Conservation Genetics

Week	Topics
May 14	Intro to Conservation Genetics/Molecular Methods/Genomics
May 21	Phylogenetics, phylogeography, barcoding
May 28	Intro Pop Genetics – Hardy Weinberg Equilibrium, linkage equilibrium, genetic diversity, effective population size, drift
June 4	Diversity and fitness, genetic rescue, gene flow

Module 2 – Advanced Topics in Conservation Genetics

Week	Topics
June 11	Detecting current gene flow, hybridization, outbreeding depression
June 18	Defining Evolutionary Significant Units, management units, populations
June 25	Non-invasive genetic sampling, Aquatic environmental DNA
July 2	genetic monitoring, Landscape genetics

Module 3 – Conservation Genomics

Week	Topics
July 9	Introduction to Conservation Genomics
July 16	Measuring adaptation and selection, GWAS, Landscape genomics
July 23	Evaluating population demography, introgression and hybridization
July 30	Metagenomics and Epigenomics

NOTE: Instructors reserve the right to make changes as needed to syllabus or schedule.