Instructor:   Kris Hundertmark  
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Office hours:  
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**Required text:**  

**Course description:**  
WLF 433 introduces students to the field of conservation genetics, which focuses on the application of genetic analyses to management and recovery of endangered species. This course will provide expanded coverage to include application of genetic techniques to general questions in wildlife and fisheries biology and management. This course requires students to have taken introductory biology courses as well as courses in ecology and genetics.  

Graduate-level credit: Students taking the course for graduate credit will also attend a 3-hour laboratory weekly in which experience will be gained using public-domain genetic analysis programs for study of conservation genetics questions. It is recommended that students have microcomputer experience because laboratory exercises will require use of a computer. Open discussions of fundamental topics of conservation genetics also will be conducted.  

**Course goals:**  
- Provide students with an understanding of a) characteristics of different types of molecular markers, their application, and strengths and weaknesses for inference, b) appropriate methods of analysis for addressing conservation genetic questions, c) genetic implications of small population size, and d) ramifications of taxonomy on conservation of threatened and endangered species.  

**Examples of student learning outcomes:**  
Students will be able to:  
- understand and communicate the fundamental genetic ramifications of small population size  
- prescribe appropriate molecular markers to answer conservation questions  
- apply appropriate genetic models to real conservation issues  
- use public-domain software tools for genetic analysis
Academic dishonesty: The UAF Student Code of Conduct is presented on page 73 of the 2005-06 UAF Catalog. You will be expected to abide by that code. No collaboration among students will be allowed on exams, quizzes or assignments unless expressly permitted by me. Copying or paraphrasing another student’s writing is a violation of the Student Code. Copying or paraphrasing published material without proper attribution is plagiarism and is a serious academic offense. If you are unsure what constitutes plagiarism, see the following web page or see me. 

www.uaf.edu/library/instruction/handouts/Plagiarism.html

Evidence of academic dishonesty will be presented to the UAF Director of Judicial Services and may result in an F for the course and/or expulsion from the University.

Disabilities: If you have a learning disability, please inform me before the end of the second week of class. If you have not already contacted the UAF Center for Health and Counseling (474-7043; TTY 474-7045) to document your disability, please do so at your earliest opportunity. They will work with me to provide reasonable and appropriate accommodations for persons with documented disabilities.

Grading:
Grades will be assigned based on your performance on the 3 exams, laboratory exercises and exam, and an in-class presentation. Late assignments will not be accepted. Recognizing the different expectations for performance of undergrads versus graduate students in the same class, a two-tiered grading system will be employed on common assignments. Regardless of the point value of any item, each will be weighted to account for the following percentages of the final grade.

400-level students:
Exam 1 30%
Exam 2 30%
Final exam 30%
Participation 10%

600-level students:
Exam 1 22%
Exam 2 22%
Final exam 22%
Laboratory exercises 24%
Participation 10%

Grading scheme for graduate students:
A \geq 90%
B 80-89%
C 70-79%
D 60-69%
F <60%
Grading scheme for undergraduate students:

- A $\geq$ 85%
- B 75-84%
- C 65-74%
- D 55-64%
- F <55%

**Attendance:** You are expected to attend all lecture and, if appropriate, laboratory activities. I will not accept laboratory assignments from students who did not attend the laboratory from which the assignment was derived unless a waiver from me is obtained in advance. Waivers will be granted only in unusual circumstances.

**Schedule:** The accompanying list of lecture and lab topics is tentative and is meant to give you a general idea of the topics we will cover in class and lab and the order in which they will be presented. There may be times when it is necessary to stray from this schedule but I will make every effort to inform you ahead of time if that happens.

**Final exam:**
The final exam will be comprehensive. More than half of the questions will cover the final third of the course with the remainder of the questions covering the first two-thirds of the course.

**Ereserve:**
Supplemental materials are placed on Ereserve, which means they are accessible over the Internet from Rasmussen library’s website. The site is password-protected to conform to copyright restrictions. You are free to read those materials and print them for personal use. Go to the site [http://eres.uaf.edu/courseindex.asp](http://eres.uaf.edu/courseindex.asp) and search for courses with Kris Hundertmark as instructor. This will take you to a screen where you can click on a link for WLF433, which will take you to a page that asks for a password. The password is XXXXXX. Click on the “accept” radio button and you will then see the reserve materials.

**Lecture topics:**

- Genetics and extinction
- Genetic diversity
- Evolution in large populations
- Evolution in small populations
- Maintenance of genetic diversity
- Genetic diversity in small populations
- Inbreeding
- Inbreeding depression
- Population fragmentation
- Genetically viable populations
- Taxonomy and management units
Metapopulations
Genetics and captive populations
Captive breeding
Quantitative variation
Forensics
Population viability analysis

Laboratory topics:

Measures of diversity: heterozygosity, allelic richness
The many interpretations of Fst
Measures of diversity: hierarchical F statistics
Measures of diversity: Rst, Qst
Population differentiation: hierarchical analysis of molecular variation (AMOVA)
Pedigree analysis
Bottleneck detection
Sequence analysis
STR analysis
Individual identification
Population viability analysis