BIOLOGY 6190
CONSERVATION GENETICS
Winter, 2017

Instructor: Thomas Dowling
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Lecture: TTH 1:00-2:15 **Place:** 333 State Hall
Office: BIO 3113
Office hours: TTH 9:30-11:00 AM or by appointment

Course Description:

Conservation genetics encompasses the fields of ecological and evolutionary genetics as it applies to conservation and management of biodiversity. This course will focus on issues pertaining to management of genetic diversity in applied, conservation-related fields. It is offered to provide a genetic perspective to students working in the broader areas of evolution, ecology, conservation biology, and biodiversity management.

Emphasis in this course will be placed on understanding the significance of evolutionary genetic principles to conservation and understanding the generation, analysis and application of molecular genetic data to address questions related to the genetic factors that contribute to, or are associated with levels of biodiversity and its management. The intention is to make the course rich with examples, and to develop an intuitive feel for molecular genetic data as applied to ecology, evolution, and conservation problems.

The course is intended to be more applied than theoretical. Lectures will be provided on specific topics that are important background information as well as specific applied topics of importance to conservation genetics. We will also read and discuss journal articles that illustrate these concepts, with students leading the discussions.

Course Objectives:

1) Review aspects of population genetics, phylogenetics and evolution as they apply to conservation; discuss management of genetic biodiversity.
2) Obtain a basic understanding of molecular genetic methods, their limitations and suitability for conservation research.
3) Introduce you to analytical approaches to assess and describe genetic diversity.
4) Evaluate the role of genetic information in conservation and management of threatened and endangered species.
5) Develop an ability to critically review the literature on conservation genetics.
6) Develop presentation skills.

Text:

Frankham, R., J. D. Ballou, and D. A. Briscoe. 2009. *Introduction to Conservation Genetics, 2nd edition.* Cambridge University Press. **(required)**

Additional reading/resources:

Assorted papers (journal articles, book chapters, etc.) for use in-class discussion **(to be made available by the instructor on Blackboard -** blackboard.wayne.edu**)**

Grades:

1) Mid-term exam (25%)
   a) Distributed 28 February, returned 7 March
2) Present lecture on topic of importance to conservation genetics (10%)
3) Review paper
   a) Literature review paper (25%)
   b) In class presentation (20%)
4) Participation in discussion (20%)

Student lecture:

One of the goals of this course is to help students develop necessary skills for their careers. To achieve this goal, students will do two formal presentations in class: 1) a lecture on a specific topic of importance to conservation genetics, and 2) presentation of results of their research on their review paper. For their lecture, students will select among a list of topics (to be provided in the first couple of weeks of classes) and develop a lecture for this course. They can use the book and I will provide other materials to assist in your task.

Review paper:

Students will be evaluated on their ability to identify a relevant management issue (can be an threatened/endangered species or general issue) and provide a comprehensive term paper or proposal. Drafts of various components of the paper will be turned in to the instructor at specified deadlines (below); requested changes must be incorporated into a final version.

Date	Day	Term Paper Task
26-Jan	TH	Term Paper Topic Discussion
7-Feb	T	Term Paper Title and 250 word Prospectus
23-Feb	TH	Introduction + References
20-Apr	TH	Term Paper Deadline

Journal articles:

We will read various journal articles illustrating the principles covered in lecture. Students will take turns leading discussion, with all others participating.

Lecture topics:

	Topic	Text
1	Introduction	Chapter 1
2	Characterizing Genetic Diversity - Molecular Markers	Chapter 3
3	Measures of variation	Chapter 3
4	Basic Theory - HWE and linkage disequilibrium	Chapter 4
	Evolutionary processes in large populations	
5	Selection	Chapter 6 & 7
6	Mutation	Chapter 7 & 8
7	Population subdivision and migration	Chapter 7
	Evolutionary processes in small populations	
8	Genetic drift and effective population size	Chapters 7, 8, 11
9	Inbreeding and depression	Chapters 12 & 13
10	Population fragmentatiom	Chapter 14
11	Phylogeny reconstruction and phylogeography	
12	Population Genomics	Chapter 10
13	Topics in applied conservation genetics	Chapter 16-22

**** The instructor reserves the right to make changes to the above schedule and topics****

ADD/DROP POLICY:

Add forms will not be signed after the second week of class. **Drop** forms must be signed before the end of "study day", which is the day after the last day of classes (Note: It is not a good idea to wait until the last day to drop; instructors are often hard to find on "study day")**.** Please note that "**incomplete**" grades will not be issued to students in poor standing who are seeking an alternative to a late drop.

CHEATING POLICY:
A student found cheating during an exam (using a "cheat sheet" or electronic device, looking at another's paper, or allowing another to look at yours), or by turning in an assignment containing any plagiarism, will receive a zero for that test or assignment with no opportunity to drop or replace that score. A second episode of cheating will result in a grade of E for the course and possible university disciplinary action.

Students with disabilities: If you have a physical or mental impairment that may interfere with your ability to successfully complete the requirements for this course, you are invited to contact Educational Accessibility Services (583 Student Center Building; 577-1851) to discuss appropriate accommodations on a confidential basis.

Academic disputes, including issues not specifically resolved or covered by this syllabus, will be resolved by following the guidelines for University Student Due Process.