ZOOLOGY 475/675 Conservation Biology (3 credits, Fall 2011)

INSTRUCTOR:
Craig Stockwell
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Office hours: Tuesday 11.15 am-12.15 pm & Thursday 12.00-1.00 pm by appointment

SCHEDULE: Class will meet from 2.00 pm to 3.15 pm on Tuesdays & Thursdays in Stevens Hall 231.

TEXT: Primack, R. B. 2008. A Primer of Conservation Biology. 4th edition, Sinauer, Sunderland.

SUPPLEMENTAL READING: "A Sand County Almanac" by Aldo Leopold
Assigned readings on Black Board or sent by e-mail as pdf files.

COURSE DESCRIPTION: Integrative approach to the study and conservation of biodiversity. Application of principles from various sub-disciplines of the biological and social sciences to current conservation problems. Prereq: ZOO 315, 315L. F

OBJECTIVES

- To examine the historical roots of conservation biology
- To examine various estimates of global bio-diversity
- To examine the history of global extinction and data for human-associated extinction events
- To examine the ethical and economic models for the conservation of biodiversity
- To evaluate the relationship between life history characteristics and extinction risk
- To examine the relative importance of anthropogenic factors in the current extinction crisis including habitat fragmentation, habitat degradation, exotic species and over-harvest
- To examine the application of genetic principles to conservation biology
- To examine the application of population biology to conservation biology
- To examine the application of spatial modeling and theory to conservation biology
- Promote inter-disciplinary thinking in students
- Promote critical thinking and the evaluation of scientific data
- Promote good communication skills (written and oral)

ATTENDANCE: According to NDSU Policy 333, attendance in classes is expected. Only the course instructor can excuse a student from course responsibilities. (The term "*course*" includes class, laboratory, field trips, group exercises, and or other activities.)

SPECIAL NEEDS: Any students with disabilities or other special needs, who need special accommodations in this course are invited to share these concerns or requests with the instructor and contact the Disability Services Office as soon as possible.

ACADEMIC RESPONSIBILITY: The academic community is operated on the basis of honesty, integrity, and fair play. NDSU Policy 335: Code of Academic Responsibility and Conduct applies to cases in which cheating, plagiarism, or other academic misconduct have occurred in an instructional context. Students found guilty of academic misconduct are subject to penalties, up to and possibly including suspension and/or expulsion. Student academic misconduct records are maintained by the Office of Registration and Records. Informational resources about academic honesty for students and instructional staff members can be found at www.ndsu.edu/academichonesty.

EVALUATION PROCEDURES AND CRITERIA:

Home work assignments: Five homework assignments will be provided each worth 20 points. This will mainly include exercises associated with expanded class material, and a few related disciplines such as, dynamic modeling, conservation education etc.

In-class assignments & pop quizzes: In-class assignments/pop quizzes (up to 20) will be provided and you will be graded on your preparation and participation. Each assignment / pop quiz will be worth 5 pts. These assignments will not be announced.

Field trip: A short field trip will be organized to the Red River Zoo in order to understand how zoos help with *ex-situ* conservation of conservation priority species. Special emphasis will be given to the state, federal and global conservation concern species and sign boards associated with various species. This field trip is mandatory to complete a specially designed assignment on developing up-to-date informational sign boards for various animals in the Red River Zoo.

Supplemental reading reviews: Students will read A Sand County Almanac by Aldo Leopold and write reviews on each chapter.

Graduate credits: All graduate students will write a review paper (50 pts) and present a lecture (50 pts) to the class concerning a current topic(s) in conservation biology. All topics must be cleared with the instructor. These topics will be researched using the current peer reviewed literature. The review paper should consist of 1500-2000 words excluding literature citations and double spaced, 12 pt Times New Roman font. Presentations will be provided with a 20 minute power point presentation + 10 minutes for questions/comments. Presentations will be graded according to completeness. The final presentations will take place during the last two weeks of class.

Grades: All assignments and tests must be completed to pass this course. No makeup exams will be given. If you must miss a test due to sickness or personal tragedy, you must contact the instructor and provide appropriate documentation.

Undergraduate students	
Test # 1 (September 22nd)	100 pts
Test # 2 (October 25th)	100 pts
Final (December 15th)	100 pts
Homework Assignments	100 pts
In class assignments / pop quizzes	100 pts
Almanac reviews	100 pts
Total	600 pts

Graduate Students	
Test # 1 (September 22nd)	100 pts
Test # 2 (October 25th)	100 pts
Final (December 15th)	100 pts
Homework Assignments	100 pts
In class assignments / pop quizzes	100 pts
Almanac reviews	100 pts
Class Presentation	50 pts
Review paper	50 pts
Total	700 pts

Grades will be assigned as follows:

90 - 100%	=	A
80 – 89%	=	B
70 – 79%	=	C
60 – 69%	=	D
below 60%	=	F

TENTATIVE SCHEDULE

DATE	TOPICS TO BE COVERED	READINGS
08/23/11	Course Introduction & Overview, Brief history, Defining Conservation Biology, Case studies	Primack: 3-10
08/25/11	What is Biodiversity? Overview, basic levels, species concept	Primack: 20-41 Myers et al. 2000 Marris 2007
08/30/11	What is Biodiversity? Distribution and measurement of biodiversity Extinction exercise presentations	
09/01/11	What is Biodiversity? How many species, recent discoveries Extinction exercise presentations	
09/06/11	The field trip to the Red River Zoo (2-4pm)	
09/08/11	The value of biodiversity; Conservation economics, tragedy of commons Extinction exercise presentations	Primack: 45-70 Hardin 1965 Costanza et al. 1997
09/13/11	The value of biodiversity; Environmental ethics Case study: Economic benefits of protecting Florida Manatee A short movie: "Mono Lake Story"	
09/15/11	Threats to biodiversity; overview, habitat fragmentation Guest lecture: "Gulf oil spill and its ecological impacts" Marshall Johnson, Outreach coordinator, Audubon Dakota	Primack: 73-122 Wilcove et al. 1995 Schlaepfer et al. 2011
09/20/11	Guest lecture: "Aldo Leopold and the oldest task in human history" Dr. Stan Temple, Science Advisor of the Aldo Leopold Foundation & Professor Emeritus of Conservation Biology, University of Wisconsin * "Greenfire" movie presentation/greenbag presentation	
09/22/11	**MIDTERM EXAM–I: 2.00-3.15 pm, Stevens 231**	
09/27/11	Threats to biodiversity; Habitat fragmentation contd.	Primack: 73-122 Wilcove et al. 1995 Schlaepfer et al 2011 Botkin et al. 2007
09/29/11	Threats to biodiversity; Environmental degradation & pollution	
10/04/11	Threats to biodiversity; Overharvesting, global climate change	
10/06/11	Threats to biodiversity; Global climate change contd. Guest lecture: "The Role of federal agencies in conserving threatened species" by Shawn Goodchild, former USFWS, FS etc.	
10/11/11	Threats to biodiversity; Diseases, invasive species	
10/13/11	Threats to biodiversity; Invasive species contd.	Primack: 125-155 Gaston & Fuller 2008
10/18/11	Extinctions; overview, mass extinctions	
10/20/11	Extinctions; 6th mass extinction, vulnerability to extinction	
10/25/11	**MIDTERM EXAM-2: 2.00-3.15 pm, Stevens 231**	
10/27/11	Population Biology and Population Viability Analysis (PVA)	
11/01/11	Population Biology and Population Viability Analysis (PVA) contd. A movie and a review: "Global Warming: the signs and the science"	
11/03/11	Conserving populations & species; Establishing new populations	Primack: 157-199
11/08/11	Conserving populations & species; Ex-situ conservation, legal protection of species	
11/10/11	Protected areas; Effectiveness, designing, challenges	Primack: 201-238
11/15/11	Conservation genetics; Introduction, application	Primack: 140-155 Frankham et al. 2004 more TBA
11/17/11	Conservation genetics; Genetic diversity, population genetics, genetics of small populations	
11/22/11	Conservation genetics; Genetics and extinctions, resolving taxonomic uncertainties, genetic management	
11/24/11	HOLIDAY (No classes)	
11/29/11	Guest lecture: "The U.S. Geological Survey's Roll in Conservation Genetics Research" by Dr. David Mushet, Biologist, Northern Prairie Wildlife Research Station	
12/01/11	Grad student presentations	
12/06/11	DEAD WEEK (Review)	
12/08/11	DEAD WEEK	
12/15/11	**FINAL EXAM 3.15-5.15 pm, Stevens 231**	