

Applied Ecology

EHS 212
Winter 2009

Instructor: Professor Richard F. Ambrose
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Class meeting: Tues/Thurs 12-1:50 pm
41-268 CHS
Office hours: Tues 3-5 pm
and by appt.

Course overview

The objective of *Applied Ecology* is to provide insight into how ecological theory and principles can be applied to solving environmental problems. *Applied Ecology* covers a variety of current environmental issues, roughly divided into three segments: (1) a brief overview of approaches for assessing environmental impacts, with an emphasis on sampling design; (2) restoration ecology and the mitigation of environmental impacts; and (3) conservation biology, focusing on scientific aspects of the biodiversity crisis, including analytical approaches to preserving species and communities and designing refuges.

Prerequisites

This course assumes knowledge of the basic ecological principles that provide the foundation for applied ecology, including population growth and dynamics, species interactions (such as competition and predation), community structure, and ecosystem dynamics. Only a very brief summary of these topics will be covered in class. Students without a firm ecological background will need to acquire a working knowledge of this material through additional reading; any good ecology textbook (such as Ricklefs' *Economy of Nature*) will suffice.

Reading

Required readings come from (1) the course reader (available from the course ftp site) and (2) the text *Conservation Biology* by Andrew Pullin (available from the Health Sciences Bookstore). Class discussions depend on the assigned reading, so it must be completed **before** class.

Grading:

Grades will be based on (1) two midterm exams, (2) one paper, (3) student participation in class, and (4) a 10-min presentation on the student's paper. Points will be allocated as indicated below.

First midterm exam	290 pts
Second midterm exam	290 pts
Term Paper	300 pts
Class participation	20 pts
Presentation	100 pts
TOTAL	1000 pts

<u>Date</u>	<u>Lecture Topic</u>	<u>Reading</u>
Jan 6	Introduction and Overview Human domination of the earth's ecosystems	Millenium Ecosystem Assess. 2005 Pullin Ch. 3
Jan 8	Global climate change Ecological effects	IPCC Working Group II 2007 Ch 4 Parmesan 2006
Jan 13	Global climate change Management alternatives	Righelato and Spracklen 2007
Jan 15	No class	
Jan 20	Environmental assessment Measurements (individuals, density, indices)	Karr 1991 Adams et al. 2002
Jan 22	Impact assessment General statistical issues	Murray et al. 2006 Ch. 4
Jan 27	Impact assessment Sampling designs for accidental impacts	Wiens and Parker 1995
Jan 29	Impact assessment Case studies: San Onofre Nuclear Generating Station, Exxon Valdez oil spill <i>Paper topic due</i>	Schroeter et al. 1993 Peterson et al. 2003
Feb 3	FIRST MIDTERM EXAM	
Feb 5	Restoration Restoration ecology	Pullin Ch. 14, Palmer et al. 1997, Young et al. 2005
Feb 10	Habitat restoration	Toth et al. 1995 Moore et al. 1999
Feb 12	Wetland restoration Case study: southern California coastal wetlands	Craft et al. 2003
Feb 17	Mitigation Case study: San Onofre Nuclear Generating Station	Parry and Ambrose 1993
Feb 19	Conservation Biology Biodiversity	Pullin Ch. 1
Feb 24	Threats to Biodiversity	Pullin Ch. 4-5, p. 207-222 Sodhi et al. 2004
Feb 26	Viable Populations Extinctions	Kolar and Lodge 2001
Mar 3	Metapopulation dynamics Case studies: pond frogs <i>Paper due</i>	Gulve 1994
Mar 5	Conservation strategies Reserves: Size, fragmentation, corridors	Pullin p. 173-178, 256-260
Mar 10	SECOND MIDTERM EXAM	
Mar 12	Student Presentations	
Mar 17	Student Presentations: 8:00 am to 11:00 am CHS 41-268	