CONSERVATION BIOLOGY
Biology 364
Spring 2011

Lecture: T, TH 9:15-10:35
Dr. P. Kemp – ST 433 (x4074)
pkemp@sandiego.edu

Lab: W 1:25-5:25
Dr. M. Wells – ST362 (x7675)
mwells@sandiego.edu

Prerequisites: Biology 190, 221, 225 and 300

Course Overview:

Biology 364 provides an introduction to the philosophy, concepts and methods to address the Earth's declining biodiversity associated with human impact. The course explores proximate causes of declining diversity at the population, species, and community levels of biological organization. We will examine the applications of genetics and population biology to the conservation and management of endangered species or declining populations.
We examine principles of community and ecosystem ecology that contribute to developing approaches for protecting habitats, ecosystems, and large-scale biodiversity. In addition to the **emphasis on biological principles** associated with understanding and solving biodiversity loss, we also address the multidisciplinary nature of human-driven biodiversity loss by examining ethical, historical, political, economic, and management issues that may underlie the problem and various solutions.

Course Organization:

The course consists of two 80-minute lectures and a four-hour laboratory each week. The lectures provide the conceptual foundation for conservation biology. In addition to lectures we will engage in student-led discussions of research and application papers associated with specific conservation biology research studies and management plans. The lecture and discussions are integrated with the laboratory that provides hands-on experiences with methods in conservation biology. The laboratory includes several field trips to examine local problems in conservation biology and restoration ecology.

Course Objectives:

1) Identify causes and patterns of loss of biological diversity in terrestrial and aquatic systems;
2) Describe methods for quantifying biodiversity in population, species, and communities;
3) Understand the major paradigms and approaches to conservation of biological diversity;
4) Develop quantitative skills regarding genetics of small populations and population viability analysis;
5) Describe methods and approaches for conservation of habitat, ecosystems, and landscapes – including strategies for design of conservation reserves, protection of corridors, and ecological restoration of habitat
6) Consider the human dimensions (ethics, politics, economics) that affect deployment and success of conservation methods;
7) Provide a forum for discussion of current issues in conservation biology

Students completing Conservation Biology should have a sound understanding of genetics, population, and ecological principles related to biodiversity issues, should be able to evaluate the science associated with various conservation studies and management plans, and should be able to appreciate the social, political, and economic factors that affect conservation issues.

Key Learning Outcomes Addressed by BIOL364:

1) Increases student understanding of biological principles of **Genetics** and **Ecology** of populations & species and applications of knowledge toward developing solutions for biodiversity protection
2) Distinguishes between the **science** of conservation biology and the **non-science** interactions of this science with economic, political, and management considerations in addressing conservation problems
3) Uses a strongly integrated laboratory to employ **scientific methods** (experimental design, data collection and analyses) to improve student understanding of study and solutions in conservation biology
4) Students critically **evaluate scientific evidence** through a series of guided discussions of current literature and through presentations of their own research studies dealing with habitat restoration
5) Students present two papers/posters using the language of science to address specific conservation issues in Southern California

Course Text and Readings:

Primary textbook: Van Dyke, Fred (2003) ***Conservation Biology: Foundations, Concepts, Applications***. McGraw Hill, New York.

In addition to the text readings, we will read research studies published in the primary technical literature, such as the journal ***Conservation Biology***. We will discuss 1–3 papers during the *Discussion** sessions indicated in the schedule. One student will be assigned to be the discussion leader for each of the research papers. The discussion papers will be available on Web-CT (http://pope.sandiego.edu), as will course announcements, class notes, and other documents handed out in class.

Course Grading:

Mid-term exams	2 @ 100 pts	200 pts
Final exam (partly comprehensive)		100 pts
Paper summaries & discussion		80 pts
Discussion Leadership		20 pts
Lecture Total		**400 pts**
Laboratory Total		**200 pts**
Total		**600 pts**

Final grades in the course will be determined by combining the points from lecture and laboratory to yield 600 total points. Final letter grades will be approximately: A = ≥90; B = 80-89; C = 70-79; D = 60-69. Student participation, enthusiasm, and demonstration of improvement, may all be used to decide final grades in borderline cases. Medical emergencies that result in missing exams or discussion summaries will be dealt with on a case-by-case basis.

Academic integrity:

All students are assumed to maintain the highest standards of academic integrity. This includes neither giving nor receiving any assistance with exams or assignments. Be careful when working in group projects to clearly understand the individual responsibilities associated with the project. (If you have any doubts, please ask for clarification).

Thanks for your attention to this document. Have a great semester learning about Conservation Biology!

Course Schedule:

Date	Topic	Textbook (†*Van Dyke*)
Origins & Foundations		
Jan 25	Introduction – Definitions & Scope	Chapter 1 (pp. 3-18)
Jan 27	Historical Perspectives	
Feb 1	Biodiversity Overview	Chapter 4
Feb 3	Measuring Diversity	
Feb 8	Paradigms for Conservation Biology	Chapter 1 (pp. 18-24)
Feb 10	Paradigms – Details / **Discussion*	Chapter 5 (pp.113-124)
Feb 15	Population Genetics	Chapter 6
Feb 17	Conservation of Genetic Diversity / **Discussion*	
Theoretical & Applied Science		
Feb 22	Conservation of Populations	Chapter 7
Feb 24	Metapopulations	Chapter 5 (pp. 125-133)
Mar 1	Population Viability Analysis / **Discussion*	
Mar 3	Review	
Mar 8	**Exam 1**	
Mar 10	Cons. of Habitat	Chapter 8 (pp. 201-221) (Chapter 5 (pp. 134-138)
Mar 15	*Spring Break*	
Mar 17		
Mar 22	Fragmentation & Patches	
Mar 24	**Discussion*	
Mar 29	Ecosystem Processes	Chapter 10
Mar 31	Ecosystem Management	
Apr 5	Restoration Ecology	Chapter 11
Apr 7	**Discussion*	
Apr 12	Solutions & the Future Review	Chapter 13 (p. 382-390)
Apr 14	**Exam 2**	
Solutions: Intersections with Social & Economic Factors		
Apr 19	Ethical Perspectives	Chapter 3
Apr 21	*Easter Break*	
Apr 26	Legal Perspectives	Chapter 2
Apr 28	**Discussion*	
May 3	Economic Perspectives	Chapter 12
May 5	**Discussion*	
May 10	Summary / Review	
May 19	**Final Exam (8:00 am)**	

†Textbook: Van Dyke, F. 2003. Conservation Biology: Foundations, Concepts, Applications. McGraw-Hill, New York.

*Student-led discussion sessions will focus on current literature regarding science questions, methods, and socio-economic implications of conservation biology.