IB 451 Conservation Biology  
4 credit hours

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Course Description: Synthesis of conservation biology with an emphasis on the preservation of biological diversity and its evolutionary potential. Laboratory includes an introduction to the use of modern molecular techniques in conservation biology, computer simulation modeling, and field conservation problem solving. Same as CPSC 436 and ENVS 420.

Prerequisite: IB 203 or consent of instructor.

Requirements that the Course Meets: Major in Integrative Biology (elective), Minor in Ecology and Conservation

Lectures: 9:30-10:50 am TTh Room 2020B  
Discussion/Computer Labs: T 12-1:50, W 1-2:50, Th 12-1:50 pm Room 2090


Student Learning Outcomes: 1) Students will demonstrate broad-based knowledge of the fundamentals of Conservation Biology, 2) Students will demonstrate skills in the observation and experimental study of organisms, using both field-based and laboratory-based approaches, 3) Students will demonstrate skills in identifying, accessing, comprehending and synthesizing scientific information, including interpretation of the primary scientific literature. This includes understanding key questions and hypotheses, interpreting results and conclusions, and evaluating quality through critique, 4) Graduate students will demonstrate the ability to communicate original scientific work in the form of an oral presentation.
Emergencies

General Emergency Response Recommendations
Run>Hide>Fight Video
Building Emergency Exits

Policies
Attendance and Makeup Policy - Office of the Dean of Students -
http://studentcode.illinois.edu/article1_part5_1-501.html

Academic Integrity
According to the Student Code, `It is the responsibility of each student to refrain from infractions of academic integrity, from conduct that may lead to suspicion of such infractions, and from conduct that aids others in such infractions.' Please know that it is my responsibility as an instructor to uphold the academic integrity policy of the University, which can be found here: http://studentcode.illinois.edu/article1_part4_1-401.html.

Disability Accomodations
To ensure that disability-related concerns are properly addressed from the beginning, students with disabilities who require assistance to participate in this class are asked to see me as soon as possible.

Lecture
January 24 - Conservation: A Historical Perspective
January 26 - "Wild by Law"
January 31 - How many species are there?
February 2 - Loss of Biodiversity: Rates, Causes, Consequences, Perspectives
February 7 - Monitoring Biodiversity
February 9 - Student Presentations
February 14 - Population Bottlenecks & Genetic Diversity
February 16 - Exam #1
February 21 - Effective Population Numbers/ Molecular versus Quantitative Genetic Perspectives and Conservation
February 23 - Gene Flow/Management measures; One-Migrant-Per-Generation
February 28 - Inbreeding/Outbreeding Depression
March 2 - Student Presentations
March 7 - Demographic/Environmental Stochasticity
March 9 - Single Species Conservation: Choosing Species
March 14 - Endangered Species Act
March 16 - Student Presentation
March 20-26 Spring Break
March 28 - Planet in Peril - Part 1
March 30 - Exam #2
April 4 - Planet in Peril - Part 2
April 6 - Habitat Fragmentation
April 11 - Invasive Species
April 13 - Student Presentations
April 18 - Conservation Forensics
April 20 - Biological Consequences of Fragmentation
April 25 - Uncertainty and Adaptive Management
April 27 - Zoos and Conservation
May 2 - Review Session Final Exam
May 4 - Reading Day
May 9 - Final Exam

Lab

Lab #1 (Week of January 23rd)
Discussion Reading - The Land Ethic
Discussion Reading - What is Conservation Biology?
Discussion Reading - What is Conservation Science?

Lab #2 (Week of January 30th)
In Class Exercise - Critical Ecosystem Partnership Fund
Critical Ecosystem Partnership Fund – Video
Discussion Reading - Biodiversity Indicator Trends
Discussion Reading - How many species are there?

Lab #3 – (Week of February 6th)
In Class Exercise - An Exploration of the IUCN Red List (Computers Needed)
Discussion Reading - Incorporating explicit geospatial data shows more species at risk of extinction than current Red List

Lab #4 – (Week of February 13th)
In Class Exercise - Genetic Drift
Discussion Reading - Environmental DNA – An emerging tool in conservation for monitoring past and present biodiversity

Lab #5 – Week of February 20th
In Class Exercise - Population Genetics - F Statistics
Discussion Reading - Conservation genetics in transition to conservation genomics
February 28 - Inbreeding/Outbreeding Depression

Lab #6 – (Week of February 27th)
In Class Exercise - Landscape Genetics
Discussion Reading - Predictive accuracy of population viability analysis in conservation biology

Lab #7 – (Week of March 6th)
In Class Exercise - Population Viability Analysis - Vortex/Data downloads (Computer Lab)

Lab #8 – (Week of March 13th)
In Class Exercise - Population Viability Analysis - Vortex/Data downloads (Computer Lab)
Lab #9 – (Week of March 27th)
In Class Exercise - Population Viability Analysis/Data Analysis - Prepare Powerpoint Presentation

Lab #10 – (Week of April 3rd)
In Class Exercise - Population Viability Analysis/Data Analysis - Group Powerpoint Presentation

Lab #11 – (Week of April 10th)
Discussion Reading - Why biodiversity is important to the functioning of real-world ecosystems
Discussion Reading - Realistic Species Losses Disproportionately Reduce Grassland Resistance to Biological Invaders

Lab #12 – (Week of April 17th)
In Class Exercise - Conservation Law
Proposed Ruling - Polar bear

Lab #13 – (Week of April 24th)
Discussion Reading - Contemporary evolution meets conservation biology
Discussion Reading - Rapid Evolution of Egg Size in Captive Salmon
Discussion Reading - What if extinction is not forever?

Graduate Student Presentations

Each graduate student enrolled in the course will be required to select and present one case history during the semester. You can choose a topic of interest (I can also assist you in choosing a topic). Presentations will be in a Powerpoint format with supporting materials (e.g., hand-outs, videos from you-tube). Lectures should last 30 minutes with 5 minutes for discussion/questions. I would encourage graduate students to provide a list of hand-out questions and/or exercises to direct classroom discussion/interaction (I leave this to you and your creativity). Lecture material will appear on exams. Graduate students will be graded on their presentations and feedback will be given. The purpose of this exercise is to provide graduate students an opportunity to prepare and present lecture materials for a class and to provide real-world examples of conservation in action.

Discussion/Lab Section

The Discussion/Lab section consists of four components. 1. Lab reading material found as pdf files, 2. Exercises, 3. Workbook and student generated questions following the exercises to help address real world problems in conservation, 4. Group projects on endangered species management using Vortex simulation modeling approaches.

Participation - Discussions

Participation is essential to the discussion section. We will expect everyone to contribute and will "encourage" people who do not regularly contribute. More importantly, participation in discussion is essential to your own education both in terms of your understanding of concepts related to conservation biology and in honing your verbal skills.

Grading

Three lecture exams - 100 points each = 300 points total
Lab - 8 labs, 25 points each = 200 points; 4 labs, Endangered species management project - powerpoint presentation 100 points. Total points = 300

Graduate student led lectures - 50 points, one each = 50 points total