# CONSERVATION BIOLOGY
# (Bio 384) – Spring 2008

*Time/Location*:

Tuesday and Thursday, 4:00 pm – 5:15 pm, Loyola 200

*Instructor*:

Dr. Robert Smith
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Loyola 208
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*Office Hours*:

Monday and Wednesday, 3:00 pm – 4:00 pm.

*Course description*:

Conservation Biology is a multidisciplinary field that seeks to identify, understand and counter threats to the earth's biodiversity. For example, conservation biologists routinely deal not only with elements of the basic biological sciences, but also the physical and social sciences. The purpose of this course is to provide students with an understanding of conservation-related issues ranging from recognition of threats to biodiversity to preserve selection, design and management. Throughout the semester we will examine a wide range of topics as we seek to understand the numerous issues faced by scientists, policy makers and others involved in conservation of species, communities and ecosystems.

*Materials*:

**Textbook**: Hunter and Gibbs 2007. Fundamentals of Conservation Biology, 3rd Edition. Blackwell Publishing, ISBN 1-4051-3545-x.

MacDonald and Service 2007. Key Topics in Conservation Biology, Blackwell Publishing, ISBN 1-4051-2249-8. I have placed copies of this book on reserve at the library. You are responsible for reading the appropriate chapters (see the syllabus). I will include exam questions from this source.

*Angel*:

I incorporate Angel as part of my teaching methodology and will make MS Powerpoint presentations, transparency overheads, etc. available to you using this medium. I will also post grades on Angel.

*Student Learning Objectives*:

Upon completion of this course, students will/will be able to:

1. Understand what conservation biology is, its history and how it differs from environmentalism.
2. Understand science as a way of knowing and how the scientific method is used to study conservation biology.
3. Discuss basic evolutionary concepts and principles, including variability, heritability, fitness, natural and sexual selection, evolutionary change, adaptation, microevolution and speciation.
4. Interpret charts and graphs used to display data.
5. Understand and be able to describe/discuss basic conservation concepts including
    a. ecosystems, communities and populations.
    b. what biodiversity is, how we measure it and why it is important.
    c. threats to biodiversity and why, given past extinction events, the current rate of extinction is of concern.
    d. what a species is, the intrinsic and instrumental value of species and how species assignment influences conservation efforts.
    e. what genetic diversity is and the role it plays in conservation.
    f. solutions to diversity threats, including preserve selection, design and management.
6. Discuss the human component to conservation, including such factors as the economics of conservation, along with the role of government, non-governmental organizations, corporations and communities in conservation.

*Evaluation Methods:*

Student outcome will be assessed via three examinations, a comprehensive final and two case studies. The final exam is mandatory! You will have the option of writing a synthetic paper on an approved topic.

All exams will be of approximately similar format. Generally the first ¼ is multiple choice, the next ¼ consists of fill in the blank and short answer questions which require no more than 2 sentences. The last ½ of the exam is a combination of moderate to longer essay questions, ranging in length from 1 paragraph to 1 plus pages to answer. Essay questions are designed to challenge students to think synthetically, to propose study designs to answer particular questions or to create/interpret graphical results in the context of a particular topic or concept. Exams cover material presented in class, homework problems, readings from your textbook, library reserve readings and any handouts I distribute.

Over the course of the semester you will complete **2** case studies. I have placed a number of studies selected from The National Center for Case Study Teaching in Science Case Collection on Angel from which you may choose. Acceptable studies for your first assignment are located in the folder marked Case Study #1 and for your second assignment in the folder marked Case Study #2. You may not submit the same case study twice.

*Optional Term paper:*

The optional paper will be worth 100 points and can be used to augment your grade. If you choose to write a term paper your final grade will be determined based on 550 pts.

The paper must include at least **8 primary** source articles and have a text (not including Literature Cited) of 12 – 15 double-spaced pages.
If you chose to do a paper:

1. You must have your topic approved by Friday, March 28th.
2. By Friday, April 11th you must provide me with a prospective title, a brief (preliminary) outline demonstrating preliminary exploration of your topic, and a list of at least 3 relevant primary articles you plan to use. If you do not turn this in you can not submit a term paper.
3. **If your topic is not approved or you do not turn in an outline you may not turn in a paper**.

Further expectations for the paper are provided on Angel.

*Grading:*

Course grades will be determined by performance on the following assignments:

If you chose not to write the optional paper:

| | |
|---|---|
| Exams I – III | 100 pts. each |
| Case Study #1 | 25 pts. |
| Case Study #2 | 25 pts. |
| Comprehensive Final Exam | 100 pts. |
| **TOTAL** | **450 pts**. |

If you chose to write the optional paper:

| | |
|---|---|
| Exams I – III | 100 pts. each |
| Case Study #1 | 25 pts. |
| Case Study #2 | 25 pts. |
| Comprehensive Final Exam | 100 pts. |
| Optional Term Paper | 100 pts. |
| **TOTAL** | **550 pts**. |

Grades will be determined by dividing the total points earned by the total points possible and multiplying by 100. Grade assignments are below:

| Percentage | Grade earned | Percentage | Grade earned |
|---|---|---|---|
| 94 – 100 | A | 73 – 76 | C |
| 90 – 93 | A- | 70 – 72 | C- |
| 87 – 89 | B+ | 66 – 69 | D+ |
| 83 – 86 | B | 60 – 65 | D |
| 80 – 82 | B- | < 60 | F |
| 77 – 79 | C+ | | |

While I am happy to discuss grade-related issues with you I will not respond to emails asking about your grade. If you have grade-related questions (or wish to discuss anything else) please feel free to stop by my office.

*Student Responsibilities*:

Students are responsible for all information presented in lecture, along with assigned readings and handouts. There is no strict attendance policy – coming to class is up to you. However, I strongly recommend that you attend all classes.

I have no tolerance for cheating. Students are expected to know and follow the University of Scranton policies concerning academic honesty.

*Center for Teaching and Learning Excellence*

In order to receive appropriate accommodations, students with disabilities must register with the Center for Teaching and Learning Excellence and provide relevant documentation. Students should contact Mary Ellen Pichiarello (Extension 4039) or Jim Muniz (Extension 4218), 5th floor, St. Thomas Hall, for an appointment.

*Important Dates:*

| | |
|---|---|
| Tuesday, 26 February | – **Exam #1** |
| Thursday, 6 March | **- Case Study #1 Due** |
| Monday, 17 March | **- First Day of Spring Break!** |
| Thursday, 3 April | **- Exam #2** |
| Friday, 28 March | **- Optional Paper Topic Approval Due** |
| Friday, 11 April | **- Optional Paper Outline due** |
| Thursday, 1 May | **- Exam #3** |
| Thursday, 17 April | **- Case Study #2 Due** |
| Friday, 2 May | **- Optional Term Paper due** |
| Exam Week | **- Comprehensive Final** |

## **Tentative** Lecture Schedule

| Week | Topic | Chapter(s) |
|---|---|---|
| 1 | **Conceptual Foundations for Conservation Biology**<br>What is Conservation Biology?<br>Basic ecological and evolutionary concepts. | Hunter and Gibbs Chpt 1 |
| 2 | **Conceptual Foundations for Conservation Biology**<br>What is diversity and why is it important? | Hunter and Gibbs Chpt 2<br>MacDonald and Service Chpt 1 |
| 3 | **Conceptual Foundations for Conservation Biology**<br>What is species diversity and why is it important? | Hunter and Gibbs Chpt 3 |
| 4 | **Conceptual Foundations for Conservation Biology**<br>What is ecosystem diversity and why is it important? | Hunter and Gibbs Chpt 4 |
| 5 | **Conceptual Foundations for Conservation Biology**<br>What is genetic diversity and why is it important? | Hunter and Gibbs Chpt 5 |
| 6 | **Conceptual Foundations for Conservation Biology**<br>Values, ethics, economics and politics | Hunter and Gibbs Chpt 15, 16, 17<br>MacDonald and Service Chpt 3 |
| 7 | **Conceptual Foundations for Conservation Biology**<br>Values, ethics, economics and politics | Hunter and Gibbs Chpt 15, 16, 17 |
| 8 | **Threats to Diversity**<br>Extinction | Hunter and Gibbs Chpt 6, 7 |
| 9 | **Threats to Diversity**<br>Habitat degredation/loss | Hunter and Gibbs Chpt 8 |
| 10 | **Threats to Diversity**<br>Overexploitation | Hunter and Gibbs Chpt 9 |
| 11 | **Threats to Diversity**<br>Species invasions | Hunter and Gibbs Chpt 10<br>MacDonald and Service Chpt 13 |
| 12 | **Solving Conservation Problems**<br>Protecting ecosystems | Hunter and Gibbs Chpt 11 |
| 13 | **Solving Conservation Problems**<br>Managing populations, managing ecosystems | Hunter and Gibbs Chpt 12, 13<br>MacDonald and Service Chpt 5 |
| 14 | **Solving Conservation Problems**<br>Managing populations, managing ecosystems | Hunter and Gibbs Chpt 12, 13<br>MacDonald and Service Chpt 6 |
| 15 | **Finals** | |