

## BIOLOGY 375-002: CONSERVATION BIOLOGY

<b>INSTRUCTOR:</b>	Dr. Gareth Russell	<b>EMAIL:</b>	<a href="mailto:russell@njit.edu">russell@njit.edu</a>
<b>OFFICE:</b>	CKB 340F ▪ (973) 596-6412	<b>OFFICE HOURS:</b>	W: 1:00pm – 2:30pm
<b>COURSE SCHEDULE:</b>	M, W: 11:30AM–12:55PM, CKB 320	<b>COURSE WEBSITE:</b>	<a href="http://moodle.njit.edu/">http://moodle.njit.edu/</a>

### COURSE DESCRIPTION:

Conservation biology is a developing and complex field. It draws upon the biological disciplines of population biology, taxonomy, ecology, genetics, and resource management as well as the fields of economics, ethics, and politics to document, understand, and protect the world's biodiversity. This course will give students an overview of this emerging discipline including the scientific methods employed, the biological principles behind conservation techniques and strategies, as well as the complexities involved in attempts to influence and implement conservation-oriented policies.



### PREREQUISITES:

- Foundations in Biology: Ecology & Evolution (BIOL 205 & 206)
- Foundations in Biology: Cell & Molecular (R120:201&202)

### REQUIRED TEXT:

- A Primer of Conservation Biology, Fifth Edition: Paper Text © 2012 by Richard B. Primack; ISBN: 978-0878936236.

### ADDITIONAL READINGS:

Throughout the semester, I'll be providing additional readings to supplement the course text and to serve as the basis for class discussions. These readings will be posted to the course Moodle site.

### LEARNING OUTCOMES:

As a result of taking this course, students should:

1. Know the different kinds and 'levels' of biological systems.
2. Know the various arguments for conserving these biological systems. (Students are left to make up their own minds whether these arguments have merit.)
  - Understand how biological systems underpin other systems (such as physical, economic or health systems), but may or may not be acknowledged as such.
  - Know the different ways of valuing biological systems.

## BIOLOGY 375-002: CONSERVATION BIOLOGY

- Be able to make an argument about the cost-benefit ratio of protecting biological systems relative to other human enterprises.
- 3. Know the major threats to biological systems worldwide.
- 4. Know some of the means of protecting biological systems.
- 5. Know some of the means of mitigation or recovery of damage to such systems, and their limitations.
  - Understand the variation in timescales at which damage and restoration processes occur.

### GRADING POLICY:

Grades will be calculated based on the proposed point distribution below. Slight changes may be made to this point distribution; you will be notified of any changes.

COMPONENT	POINTS
Reading reports	100 points
Case Study Presentation	100 points

COMPONENT	POINTS
Midterm	100 points
Final Exam	100 points
TOTAL	400 points

- ⊕ Please note that **this is a flipped course**. After the first class, **all readings are to be done before the class in which they are listed**. Failure to do this will be considered non-participation in the course.
- ⊕ **Reading reports.** For some classes you will have an assigned reading from the textbook, typically around 10 pages, *and* one or two readings from the primary literature (usually articles from a scientific journal). Both readings *must* be completed prior to the class. For each *primary literature* reading, you must write up a short report as follows, to be turned in at the beginning of the class.
  - Give the title, author(s), date, and source of each reading. (See handout "How to Cite" in Moodle for examples of citation style.)
  - State the senior author's affiliation (e.g., Department of Zoology, University of Michigan; or Environmental Defense Fund).
  - In 1–3 sentences, summarize the main point(s) of the reading.
  - In 1–2 sentences each, describe the major strength of the reading, the major weakness, and give your overall opinion/evaluation of the reading.
  - In 1–2 sentences, state why you think that this reading was assigned as a complement to the textbook reading
  - Grading of reports: not turned in: 0 points. Inadequate: 2 points. Ok: 3 points. Good: 4 points. Excellent: 5 points.
- ⊕ Exams will be predominantly short-answer style. The mid-term exam will focus on case studies, and the final exam will be similar to the entrance quiz.
- ⊕ All students will research in detail a novel case study in conservation biology and share what he/she researched in an 8 minute presentation to the class. Each student will propose his/her case study, to be approved by the instructor.

## **BIOLOGY 375-002: CONSERVATION BIOLOGY**

### **COURSE POLICIES:**

#### **Electronics/Cell Phone Policy:**

No electronics (cell phones etc.) in class; laptops permitted for note-taking only.

#### **Attendance:**

I expect you to attend all the lectures; you are responsible for all material covered in the lectures.

#### **Make-Up Exams and Quizzes:**

Make up exams and quizzes will be permitted only with a doctor's or a dean's letter or with prior approval. If you have a serious reason for missing an exam, you must contact me **BEFORE** the scheduled exam period to notify me that you cannot take the exam.



**Late Assignments:** Late assignments will be accepted but penalized 10% per day late.

**Academic Integrity:** I have a zero tolerance policy for academic dishonesty, including plagiarism and cheating. If you have any questions about what constitutes plagiarism or cheating, please ask me or refer to the academic integrity code: <http://www5.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf>.

**COURSE OUTLINE:** *Please note that this is the proposed schedule. I reserve the right to make changes to the schedule when needed; you will be notified of any changes. Additional readings and assignments will be posted to the course website.*

**BIOLOGY 375-002: CONSERVATION BIOLOGY**

DATE	LECTURE TOPIC	READINGS / ASSIGNMENTS (COMPLETE BEFORE CLASS)
W – 1/18	About the Course. Entry quiz.	
M – 1/23	Defining Conservation Biology.	Chapter 1 (pp. 3-17), Soulé 1985, Kareiva & Marvier 2012
W – 1/25	<b>NO CLASS (MONDAY CLASSES MEET)</b>	
W – 1/25	Biodiversity: Species Diversity & Genetic Diversity	Chapter 2 (pp. 19-27) Isaac et al. 2004
M – 1/30	Ecosystem Diversity	Chapter 2 (pp. 27-35) Pace et al. 1999, Polis et al. 2000
W – 2/1	Patterns of biodiversity I	Chapter 2 (pp. 33-45)
M – 2/6	Patterns of biodiversity II	Chapter 3 (pp. 47-66) 2 Jenkins papers.
W – 2/8	Valuing Biodiversity I: Direct & Indirect Economic Values	Chapter 3 (pp. 47-66)
M – 2/13	Valuing Biodiversity II	Chapter 3 (pp. 66-77)
W – 2/15	Human Population Growth, Habitat Destruction, Fragmentation	Chapter 4 (pp. 79-98)
M – 2/20	Environmental Degradation, Pollution, Climate Change	Chapter 4 (pp. 98-110)
W – 2/22	Climate Change continued	
M – 2/27	Overexploitation, Invasive Species, Disease	Chapter 4 (pp. 110-132) Pejchar and Mooney 2009
W – 3/1	Invasive Species continued	
M – 3/6	Review	Chapter 5 (pp. 135-150)
W – 3/8	Mid-term exam	Chapter 5 (pp. 150-167)
M – 3/13	<b>SPRING BREAK REVIEW</b>	
W – 3/15	<b>SPRING BREAK MIDTERM EXAM</b>	
M – 3/20	Extinction	
W – 3/22	Extinction continued. Problems of Small Populations.	
M – 3/27	Movie: "Crash: A Tale of Two Species"	Chapter 6 (pp. 169-191) Chapter 6 (pp. 191-199)
W – 3/29	<i>Discussion:</i> Red knots and Horseshoe Crabs in the Delaware Bay. Applied Population Biology & Conservation Categories	Chapter 6 (pp. 199-211)
M – 4/3	Legal Protection & Establishing New Populations.	Niles et al. 2009, Niles interview 2011, FWS 2013
W – 4/5	Protected Areas: Establishment & Design	Chapter 7 (pp. 213-239)
M – 4/10	Protected Areas: Management	Chapter 7 (pp. 239-252)
W – 4/12	Conservation Outside of Protected Areas	Chapter 8 (pp. 255-270)
M – 4/17	Video: <i>Saving Species</i> (BBC Planet Earth Series)	
W – 4/19	Restoration Ecology	
M – 4/24	Sustainable Development: Local & National	Chapter 8 (pp. 270-281)
W – 4/26	<b>Class presentations</b>	Chapter 9 (pp. 283-303)
M – 5/1	Review and wrap-up	
<b>TBD</b>	<b>FINAL EXAM WEEK: MAY 5-11, 2017</b>	