BIOL 312 Conservation Biology

Time: Mondays Wednesdays, Fridays, 1:00-1:50 Location: 222 CAS

Instructor: Dr. Loren B. Byrne Phone: X 3890 Email: lbyrne@rwu.edu
Office: 243 MNS Office Hours: Tue 11-12, Wed 10-11am, 2:30-3:30pm or by appt.

Quotes that summarize Dr. Byrne's teaching and learning philosophy:

"The mind is not a vessel to be filled but a fire to be kindled." ~ Plutarch
"Teachers open the door. You must enter by yourself." ~ Chinese proverb
"(Intelligence) is 1% inspiration and 99% perspiration." ~ Thomas Alva Edison
"Today a reader, tomorrow a leader." ~ W. Fusselman
"When we try to pick out anything by itself, we find it is tied to everything else in the universe." ~ John Muir

Course introduction:

Humans are now a dominant force of nature on Earth because our collective activities have radically altered the composition and patterns of landscapes with impacts on biodiversity patterns and biogeochemical cycles. The field of conservation biology emerged in the 1980's in response to the growing recognition that humans have initiated the 6th mass extinction of life on Earth. At a fundamental level, conservation biology includes the study of the multivariate ***causes*** of declines in biodiversity (across all levels of biological organization), the ***problems*** of biodiversity loss, and the scientific and sociocultural ***responses*** needed to prevent species from going extinct and conserve their populations and habitats. These 3 issues give rise to "CPR", an acronym that gives conservation biology its "breath."

By necessity, conservation biology is an interdisciplinary field of study because understanding the complex relationships among humans, other species and the environment requires knowledge gained from—among other fields—ecology, genetics, political science, sociology, economics and philosophy. This course will provide a broad overview of contemporary conservation biology with emphasis on 1) applying ecological theories to the practice of protecting and restoring populations and ecosystems and 2) discussing the relevance of biodiversity conservation to the well-being of humanity.

Be forewarned: this course is reading and discussion intensive! (This is a good thing for your education—see quotes 3 and 4 above.) Lectures will constitute a minor part of class time and will mostly be used to illustrate topics covered in the texts with case studies, diagrams, images, etc. Thus, to fully understand the issues, you must read and—not just skim—but READ WHILE THINKING CRITICALLY about the material. Everyone will benefit the most from this course if we all critically read and the material before class and ***engage each other in civil discourse*** about it during class.

Course objectives:

During this course, students are expected to:

- Develop an interdisciplinary vocabulary and perspectives to facilitate informed discussion of key issues and problems related to conservation biology
- Gain increased understanding of ecological theories and their application to real world environmental problems
- Become familiar with historical and current developments in conservation biology research
- Improve their critical scientific writing and thinking skills

and perhaps most importantly

- Enjoy themselves in the pursuit of scientific knowledge and understanding!

Required texts

Primack, R. 2004. A Primer of Conservation Biology, 3rd ed. Sinauer Associates.
Wilson, E.O. 2002. The Future of Life. Vintage Books.
Other readings from the literature to be provided digitally or as hard-copies

Attendance policy:

Because we form a learning *community* in this course, the presence and participation of each student benefits us all. Thus, attendance is expected (read: required) for all class meetings. Excused absences will be granted only for legitimate reasons and when the student informs the professor (by email is fine) in advance of the expected absence (ASAP or at least 6 hours notice for emergencies or illness). If you expect to miss class for legitimate religious observances, you must inform the professor ASAP.

Academic honesty and integrity

By becoming an RWU student, you have agreed to abide by the Academic Integrity pledge ("…to pursue the highest ideals of academic life… to be honest…") which means that you will not cheat, fabricate information, plagiarize, be fraudulent or damage others' work. In addition, maintaining academic integrity includes respecting others and learning how to disagree with ideas while not being disagreeable. These ideals serve as the code of conduct for this course. Any student who violates this pledge and code of academic integrity will bear the consequences following the definitions, policies and procedures as described in the University Catalog.

Academic support services

If you are a student with a disability and you wish to receive academic accommodations for any aspect of this course, you must first register with Disability Support Services on the second floor of the University Library in the Center for Academic Development. All students wishing to receive accommodations must inform the professor and have required forms in process ***at least one week*** in advance of the date for which accommodations are sought.

Required assignments & grading:

Students' grades will be based on the following:	**% Value of final grade**
➢ In-class quizzes, writings and activities (i.e., all half sheet assignments)	25
➢ Journal construction (DUE in class Wed. 9/5 with 2 entries)	5
➢ Journal entries based on readings and questions (First one due 9/5)	25
➢ Semester-long paper or project (with iterative drafts)	25
➢ Final discussion (during final exam period based on synthesis essays)	5
➢ Synthesis essay	15

Grading scale:

A= ≥ 93%	A- = 90-92.9%	B+= 87-89.9%	B= 83-86.9%	B-= 80-82.9%
C+= 77-79.9%	C= 73-76.9%	C-= 70-72.9%	D= 60-69.9%	F= ≤59.9%

Important events:

Week of 10/8: Required evening meeting, ~1 ½ hrs for a twilight hike and discussion under the stars and over the water about these questions: What does it mean to be a conservation biologist? What role should scientists have in environmental advocacy and activism?

10/10: 5:30 seminar by Eugenie Scott about "the evolution controversy" in the Rec. Center

TBA: 2 Wednesdays at 4pm, research seminars by Dr. Warren and your professor

BIOL 312 Conservation Biology: Semester outline

Week	Lecture/discussion topic	Readings *(to be completed before that day's class)*
1	8/29: Introductions and expectations 8/31: What is conservation biology?	 8/31: Primack pp 1-10; Wilson prologue
2	9/3: *Labor Day- No Class* **Part I: The state of the world; *Causes* of BD loss** 9/5: What are ecology & biodiversity (BD)? 9/7: What affects global biodiversity patterns?	 9/5: Primack pp 11-34 9/7: Wilson ch. 1; Gaston 2000
3	9/10: Ecology of the human population 9/12: Into the Anthropocene 9/14: Is life undergoing a 6th mass extinction?	9/10: Wilson ch. 2; Cohen 2005 9/12: Crutzen '02, Vitousek et al. '97, Sanderson et al. '00 9/14: Primack pp. 34-36, 61-72
4	9/17: HIPPO & habitat loss 9/19: Habitat fragmentation & degradation 9/21: Effects of global climate change	9/17: Wilson pp. 42-57; Primack pp. 72-84 9/19: Primack pp. 84-95; Wilson pp. 58-66 9/21: Primack pp. 95-100; Wilson pp. 67-78
5	9/24: Overexploitation, invasions, diseases 9/26: Extinction vulnerability & status **Part II: BD importance; *Problems* with its decline** 9/28: What are ecosystem services?	9/24: Primack pp. 100-113; Others TBA 9/26: Handout Ch. 8; Wilson ch. 4 9/28: Primack pp. 36-54
6	10/1: The ecology of ecosystem services 10/3: The (techno-)arrogance of humanity? 10/5: Synthesis: ecosystems and human well-being	10/1: Wilson ch. 5, Kremen and Ostfeld 2005 10/3: Wilson ch. 6 10/5: MEA: Preface & Summary (1-24)
7	10/8: *Columbus Day—No class* **Part III: *Responses* needed: science & practice** 10/9: *Tuesday class*: Conserving populations 10/10: What's wrong with small populations? 10/12: Metapopulations & landscapes	 10/9: Hughes et al. '97, Balmford et al. '03, Luck et al. '03 10/10: Primack pp. 121-135 10/12: Primack pp. 144-146, Wiens 1997, Karieva 1987
8	10/15: Pops & Island Biogeography Theory 10/17: Captive breeding & reintroductions 10/19: Conserving communities & ecosystems	10/15: TBA 10/17: Primack pp. 146-166 10/17: Primack pp. 184-199, others TBA
9	10/22: How should nature reserves be designed? 10/24: The challenges of ecosystem management 10/26: What role for restoration?	10/22: Primack pp. 200-210, others TBA 10/24: Primack pp. 210-225 10/26: Primack pp. 225-234, others TBA
10	10/29: *No class- Ecological Landsc. Conf.* 10/31: *No class- Ecological Landsc. Conf.* **Part IV: *Responses* needed: The human element** 11/2: Attitudes & worldviews	 11/2: Wilson pp. 149-164, Primack pp. 54-59
11	11/5: Do organisms deserve legal standing? 11/7: Community-based conservation 11/9: International agreements and issues	11/5: Primack pp. 171-177, pp. 239-244 11/7: Primack pp. 244-251, Berkes '04, Chan et al. '07 11/9: Primack pp. 251-265, Balmford et al. 2005
12	11/12: What role do NGO's play? 11/14: Do politics help or hinder conservation? 11/16: Who cares about BD in a "world of use"?	11/12: Wilson pp 165-189 11/14: Johns 2007, others TBA 11/16: Miller 2005, Redford and Richter 1999
13	11/19: Conservation for sustainability 11/21: *No class- Thanksgiving break* 11/23: *No class- Thanksgiving break*	11/19: revisit MEA, Raven 2002, Shearmen 1990
14	11/26: Student-chosen topics 11/28: Student-chosen topics 11/30: Student-chosen topics	11/26: Student-chosen papers 11/28: Student-chosen papers 11/30: Student-chosen papers
15	12/3: Review: What do and don't we know? 12/5: Synthesis: Coupled socio-ecological systems 12/7: Epilogue: What does the future hold?	12/3: Primack pp. 265-273 12/5: Liu et al. 2003, others TBA 12/7: Sala et al. 2000

FINAL EXAM PERIOD: TBD: Discussion session and/or take-home essay exam due

Assignment details:

- In-class quizzes and writings will be based on assigned readings and are meant to assess students' recall and understanding of vocabulary as well as develop higher-level critical thinking skills including application of concepts to problems. Activities (e.g., in groups) will be used to improve communication skills and provide different methods of developing and assessing deeper understanding. **Students are encouraged to submit quiz questions and suggestions for writings and activities** that are inspired by notes written in their journals (see next point). The professor promises to use some of them!

- Journal construction and entries: Each student will construct a journal that will be used to take notes on readings. Journal construction will be assessed with a rubric based the following rules.

  - **Rules for journal construction** *(Discussion question: How are these rules related to the course content?)*
    1. **Use only non-virgin materials:** A non-virgin material is one that is not being used for the first time (i.e., it had a prior purpose). Examples of material that can be used are: cardboard from used boxes, string from existing packaging, sheets of paper printed on 1-side. *Your journal should have a cover that you create, not one bought from a store.*
    2. **Design the journal to be durable and portable:** Make sure that: 1) the pages are securely fastened together, 2) that the professor can easily carry it and 3) it will last all semester long.
    3. **Be creative and have the journal reflect your personality:** Use materials that scream you!
    4. **Required first entry:** On the first page of your journal, write a paragraph or two describing how you feel about the journal-making process and your finished journal. Is it what you envisioned? Were materials easy to find? How does it reflect you as a creative, cultural person? Etc….

  - **Journal entries:** Your created journal is a notebook for you to record your thoughts as you read assigned texts. Note-taking should help you digest and respond to the content and provide a starting point for in-class discussions. You will want to record key vocabulary words and concepts as well as questions about confusing/unknown points. Also, try to summarize what you're reading by addressing the following question: What is the main "take-home message" being conveyed? Use these notes to inspire quiz questions and activities that you can send to the professor before class.
    - Entries will be assessed based on evidence of critical engagement with the readings. (Refer to Bloom taxonomy handouts for guidelines of how to exhibit higher-level thinking.)
    - **The first reading-based entry will be due 9/5 based on pp. 1-34 of Primack &Wilson Ch. 1.**
    - Other due dates and number of entries required will be decided in class with your input.

- Details about the semester-long paper or project and synthesis essays will be provided soon. You will be given the opportunity to provide input about the structure and assessment of these assignments.