BIO 312 Conservation Biology

Time: Mondays Wednesdays, Fridays, 1:00-1:50 Location: GHH 106

Instructor: Dr. Loren B. Byrne Phone: X 3890 Email: lbyrne@rwu.edu
Office: 227 MNS Office Hours: Mondays 10-11 & 2-2:30, Tuesdays 1-2, Wednesdays 10-11, 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
"High-quality learning is absolutely essential for high-quality living." ~ L. Dee Fink

Course introduction:

Humans are now a dominant ecological force on Earth and have initiated the 6th mass extinction of life. In response, the field of conservation biology emerged in the 1980s to help reduce and stop the loss of biodiversity. This field 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 conserve populations, species and ecosystems. These three topics give rise to "CPR", an acronym that gives conservation biology its "breath" and breadth

By necessity, conservation biology is an interdisciplinary field of study because understanding the complex relationships among humans, other species and environments 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, 2) discussing the relevance of biodiversity conservation to the well-being of humanity and 3) examining the complex sociocultural dimensions and variables of working toward successful biodiversity conservation.

Be prepared: this course is reading, writing and participation intensive (a good thing for your education—see quotes 3 and 4 above). Lectures will usually be a minor part of class time and will mostly be used to emphasize topics covered in the texts with context, examples, diagrams, images, etc. Thus, you will maximize your learning during this course if you read assigned texts carefully and critically before class and then ***engage with your classmates in thoughtful discussion*** about the material in class.

Course goals for learning outcomes:

After this course, students should be able to:

- Use an interdisciplinary vocabulary and perspective to successfully describe and discuss key issues in conservation biology, especially causes and consequences of and responses to biodiversity loss;
- Apply ecological theories to real world conservation and environmental problems;
- Identify interactions among ecological and sociocultural variables in the context of conservation issues;
- Describe the importance of biodiversity and ecosystem services for sustaining human well-being;
- More successfully engage in critical scientific reading, writing and thinking;

  and perhaps most importantly
- Appreciate and enjoy the pursuit of interdisciplinary, scientific knowledge and understanding!

Required texts: Primack, R. 2012. A Primer of Conservation Biology, 5th ed. Sinauer Associates.
Wilson, E.O. 2002. The Future of Life. Vintage Books. Other readings to be provided digitally or as hard copies

Required assignments & grading:

Students' grades will be based on the following:	**% Value of final grade**
➢ Semester-long paper or project (with proposal and draft)	25
➢ Final synthesis essay	15
➢ Final oral exam (discussion about final essays during final exam period)	5
➢ Home & IC work	18
➢ Reading guides	20
➢ Journal entries	10
➢ Species case study	7

Essential info. about the following topics is provided on the electronic version sent via email and located in Bridges. You are fully responsible for reviewing this information and will be held accountable to all official course policies provided: drop dates, assignment submission, class communications, attendance & due dates, academic integrity (plagiarism) & support services.

➢ ***Remember:*** **Ultimately you are responsible for your own learning! No one else but you can rewire the neurons in your brain to generate personal understanding, knowledge and wisdom.**

BIOL 312 Conservation Biology: Semester Schedule

Week	Topic	Readings *(to be completed before that day's class)*
1	8/28: Introductions and expectations 8/30: What is conservation biology?	8/30: Primack pp 1-16; Wilson prologue
2	**Part I: Biodiversity(BD) science & *Causes* of BD loss** 9/2: *No class- Labor Day* 9/4: What are ecology & biodiversity? 9/8: What affects global biodiversity patterns?	9/4: Primack pp 19-43 9/8: Wilson ch. 1; Gaston 2000
3	9/9: Ecology of the global human population 9/11: Earth in the Anthropocene 9/13: Is life undergoing a 6th mass extinction?	9/9: Wilson pp. 28-41; UN reading & country data 9/11: Crutzen '02 & TBD 9/13: Primack pp. 135-142; Ceballos et al.
4	9/16: HIPPO & habitat loss 9/18: Habitat fragmentation & degradation 9/20: Global climate change	9/16: Wilson pp. 42-57; Primack pp. 83-92 9/18: Primack pp. 92-104; Wilson pp. 58-66 9/20: Primack pp. 104-110; Wilson pp. 67-70
5	9/23: Overexploitation, invasions, diseases 9/25: *Interlude: Research for conservation* 9/27: Synthesis: Synergisms & wicked problems	9/23: Primack pp. 110-129, Wilson pp. 70-78 9/25: TBA 9/27: Amphibian decline jigsaw articles
6	9/30: Extinction vulnerability & status **Part II: *Problems* with the loss of biodiversity** 10/2: Is BD loss a threat to human well-being? 10/4: The ecology of ecosystem services	9/30: Handout Ch. 8; Wilson ch. 4 10/2: MEA Synthesis Report or trade-offs art. 10/4: Wilson ch. 5
7	10/7: What are the many values of BD? 10/9: The (techno-) arrogance of humanity? 10/11: Does BD loss lead to poverty?	10/7: Primack pp. 47-71, other value article 10/9: Wilson ch. 6 10/11: TBD
8	10/14: No class – Columbus Day **Part III: *Responses* needed: science & practice** 10/15: TUE: Conserving populations 10/16: ~~TUE:~~ What's wrong with small pops? 10/18: Captive breeding & reintroductions	10/15: Primack 170-177, Balmford et al.'03, Luck et al.'03 10/16: Primack pp. 150-165 10/18: Primack pp. 191-210, Zoo articles
9	10/21: Pops & Island Biogeography Theory 10/23: Metapopulations & landscapes 10/25: Conserving communities & ecosystems	10/21: Primack pp. 142-146, Wiens 2009, other TBA 10/23: Primack pp. 178-180 10/25: Primack pp. 213-229, Others TBA
10	10/28: How should nature reserves be designed? 10/30: Challenges of ecosystem management 11/1: What role for restoration?	10/28: Primack pp. 229-238 10/30: Primack pp. 239-250, 260-262 11/1: Primack pp. 270-280, Others TBA
11	**Part IV: *Responses* needed: The human element** 11/4: Ethics, attitudes & worldviews 11/6: Who cares about nature lately anyway? 11/8: Do organisms deserve legal standing?	11/4: Wilson pp. 24-28, 39-41, 149-160 AND Primack pp. 72-75 11/6: Miller 2005, Kahan interview 11/8: Primack pp. 184-190, Plover news
12	11/11: What role do politics & policies play? 11/13: International agreements and issues 11/15: What role do NGOs play?	11/11: Johns 2007, others TBA 11/13: Primack pp. 292-303, Balmford et al. 2005 11/15: Wilson pp 164-189
13	11/18: Community-based conservation 11/20: Tough decisions: conservation conflicts 11/22: What to let go?	11/18: Primack pp. 263-270, Berkes '04, Chan et al. '07 11/20: TBD 11/22: "What to let go" article
14	11/25: Is triage an acceptable response? 11/27 & 29: *No class- Thanksgiving break*	11/25: TBD
15	12/2: Conservation success stories 12/4: Review: What do and don't we know? 12/6: Synthesis: Student-chosen	12/2: WWF website 12/4: Primack *(from 3rd ed)* pp. 265-273 12/6: TBA/Student-chosen papers
16	12/9: Epilogue: What does the future hold?	12/9: Wilson pp. 160-164

FINAL EXAM PERIOD: Mon Dec 16, 2:45-4:45 pm: Required final oral exam about synthesis essay

The professor reserves the right to modify this schedule as needed during the semester*