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OPEN OFFICE HOURS: Mon, Wed 10:00 – 12:00 in Science Center 163, 170G; *or by appointment*

TEXTS: None – articles will be distributed.

MEETINGS: Tue, Thu @ 4:00-5:15 PM in Science Center 342

COURSE OBJECTIVES: The planet earth is a dynamic system, and its ‘biosphere’ is undergoing rapid change, primarily due to the activities of humans. *Biological Systems & Global Environmental Change* is focused on understanding how these changes are occurring, what remains to be discovered, and what (if anything) can be done to avoid the least desirable environmental changes. The course will necessarily take a global view, incorporating studies from throughout both the developing world and economically advanced countries such as ours. Readings will be interdisciplinary, and include ecological, sociological, and economic approaches to global environmental change.

By the end of this course, you will (1) be able to explain the systems approach to understanding environmental change, and thus why it is difficult to make predictions about the future consequences of present environmental impacts. (2) Understand in depth some of the most important topics in environmental change science, and have developed some understanding of how economic and social forces in the developing and industrialized countries contribute to global environmental change. (3) Be able to critically read and discuss the primary literature in the field, at the level expected of a competent graduate student. (4) Be able to provide a sensible short-list of important research topics in global change science that could be undertaken as research projects as a graduate student, post-doc, or junior researcher. (4) Write a useful and professional critical review & bibliography of a topic in environmental change science, which provides an overview of the most important recent research on the topic.

BY 425 is classified as a *University Course*, and counts for the *Global & Contemporary Issues and Science, Technology & Society* knowledge areas.

COURSE FORMAT: Before each class, I will provide a set of papers to read. The papers will include a mix of scientific reviews and original research papers. You must read each carefully before class. On some Fridays, there will be talks that I expect you to attend (assuming you don’t have a conflict). In class, we will discuss each. You are expected to actively participate in the discussions. I will evaluate students every week on participation; you will receive a grade of 0 – 4, where 0 = not present, 1 = unprepared & uninvolved, 2 = unprepared but adequately involved, 3 = adequately prepared and involved, 4 = excellent preparation and involvement.

NOTEBOOK: You are expected to keep a dedicated course notebook. In this notebook, you will take notes on the papers you read and on the class discussions. The notebook should be orderly, e.g. there should be a table of contents, entries should be dated, each paper should be cited completely, a title or topic sentence should provide a header to each entry. The notebook is intended to be an aid at understanding and evaluating the course material, and a resource to go back to whenever you need some refreshing on a topic or paper. You will also use the notebook as an aid in participating during discussions. I will collect the notebook 3 – 4 times during the semester, and you will be evaluated based on clarity and informativeness.

QUESTIONS: Each Monday, I will post five questions (on Blackboard) based on the week’s papers and discussion topics. You will be expected to answer them, in writing, by Tuesday of the following week. I encourage you to answer the questions using the Blackboard drop-box. You will be docked 20% of a grade for each class period after the due date for which it is late.

REVIEW PAPER: You will write one 3500 word review paper (excluding abstract & references) on a specific topic related to one of the areas covered in the course. The review must have at least 30 peer-reviewed references (maximum = 50). The format and scope will be identical to the review journal *Frontiers in Ecology and the Environment* <http://www.frontiersinecology.org/reviews.htm>.

Due dates:

2/16 Submit a one paragraph description of the scope of your review (review proposal).

3/16 Submit a detailed outline (1-2 pages, plus provisional bibliography).

4/20 (Optional) Submit a rough draft for evaluation.

4/27 Submit the final draft for grading.

You will lose 10% of your grade for each day late. See me in advance if you need to negotiate a later due date.

FINAL EXAM: There will be no midterms. There will be one take-home final exam, which will be distributed 4/27 (the last day of class), and will be due 4:00 PM on 5/4 (Friday of finals week). It will require you to integrate what you have learned from the readings and discussions. You will be able to use your notebook, your responses to the study questions, and the papers. You may not discuss the questions with other class members, or use their notes. (You may look over classmates' notes, and correct your own, before the final is distributed). You will be required to sign an honor code statement before the exam is distributed. If you have any questions about the exam, promptly contact me.

ASSESSMENT: I will post grades on Blackboard. The final grade will be based on participation (10%), the notebook (10%), weekly questions (20%), the review (30% of grade), and one cumulative final (30% of grade). Course grades are calculated by converting the points earned within each category to the proportion of possible points, then multiplying that proportion by its weighting. For example, if the maximum cumulative notebook grade score is 150 points, and you receive 125 points on it, when figuring your final course grade I will calculate: $(125/150) * 0.10$. Grades will be based on a percentage of the total points, scaled to meet the above breakdowns: 90% or greater = A, 86-89% = B+, 80-85% = B, 76-79% = C+, 70%-75% = C, 66-69% = D+, 60-65% = D, 59% or less = F. However, I reserve the right to curve down (lower the grade cutoffs) if I judge it warranted. In the past, I have gone as low as 85% for an A.

Note: *Students taking this course for graduate credit (BY525) will be expected to participate and perform at a more advanced level than undergraduates (BY425), and will be assessed accordingly.*

MISC. POLICY: I take a serious view of cheating, forbidden collaboration, and plagiarism on exams and assignments. I will take measures to detect plagiarism of online sources. If you do not know what plagiarism is, refer to <http://www.clarkson.edu/library/research/plagiarism.html>; if you are unclear about whether something is considered unacceptable in my class, ask me BEFORE submitting an assignment. If I do detect cheating by you, you will receive a zero on the exam, paper or homework assignment, and your name will be submitted to the Clarkson University Academic Integrity Committee.

Tentative Semester Schedule

<i>WEEK</i>	<i>DATE</i>	<i>TOPIC</i>
1	1/11	Course Introduction
2	1/16	Complex Systems & Global Change
	1/18	Complex Systems & Global Change
3	1/23	Ecosystem Services
	1/25	No Class - Ecosystem Services
4	1/30	No Class Biodiversity Hotspots
	2/1	Biodiversity Hotspots
5	2/6	Loss of Keystone Species
	2/8	Diversity: Necessary or Redundant?
6	2/13	Invasive Species in Great Lakes
	2/15	Invasive Species and Nutrient Cycling
7	2/20	Break!
	2/22	Exotic Pathogens
8	2/27	Tropical Forest Loss
	3/1	Coral Reef Declines
9	3/6	Sustainable Forestry
	3/8	Regulation of Freshwater Systems
10	3/13	Sustainable Ocean Fisheries
	3/15	Tropical Commodity Agriculture
11		Spring Break
12	3/27	Bioaccumulation of Mercury
	3/29	Endocrine Disruptors
13	4/3	Nitrogen Cycle
	4/5	Global Carbon Cycle & Sequestration
14	4/10	Climate Change - Scenarios
	4/12	Climate Change - Consequences
15	4/17	Restoration Ecology
	4/19	Parks & People
16	4/24	Human Population Growth
	4/26	Wrap-up, and final paper due
17		Take Home Final

Assigned Biology Seminars for Spring 2005

Presented in Room 214 Bertrand Snell Hall on Friday from 2-3 PM

January 19	Michael Twiss	Phytoplankton Community Assessment in the Lake Ontario Coastal and Pelagic Zone using Fluorimetric Methods
March 30	Donald J Leopold Environmental and Forest Biology SUNY-ESF	From ferns to fens: Highlights of biodiversity-related research in New York State