

IDS 2935 “Nature in a Hungry World” – or: Reconciling Biodiversity Conservation and “Progress”

Quest 2

I. Course Information

Spring 2022

Meeting Day/Time: T 10:40-11:30 AND 0032

Th 10:40-12:35 MAT0004

Primary General Education Verbatim Statement:

Biological science courses provide instruction in the basic concepts, theories and terms of the scientific method in the context of the life sciences. Courses focus on major scientific developments and their impacts on society, science and the environment, and the relevant processes that govern biological systems. Students will formulate empirically-testable hypotheses derived from the study of living things, apply logical reasoning skills through scientific criticism and argument, and apply techniques of discovery and critical thinking to evaluate outcomes of experiments.

NOTICE: This is an honors course. A minimum grade of B is required to earn Academic points towards your Honors Completion Requirements. (Exception: Honors Quest I and II sections require a C). Once you have earned your final grade in this course, please upload the course information and final grade from your Unofficial Transcript into your Honors Canvas Cohort: Honors Completion module to earn Honors Completion credit.

For more info on the honors program, contact Honors Program, 201 Walker Hall, 352-392-1519

If you have a quick questions for an Honors advisor? Email advisor@honors.ufl.edu

If you need an Honors advising appointment? Schedule via Microsoft

Bookings: <https://bit.ly/ufhonorsadvising>

Instructor Information

- Mathew Leibold mleibold@ufl.edu
- Bartram 627
- Office hours: right after class on T, Th

Textbook

There is no formal textbook for this class. Instead, we will be reading from multiple sources including Pope Francis’ ‘Encyclical’ and the IPCC report on climate change, as well as items in the primary and

secondary science and policy literature, and finishing with the ‘Dasgupta Review’ of the Economics of Biodiversity.

Course Description

The current generation of humans is the first in human history to experience two important events: 1) Reaching what seems to be carrying capacity for humans on earth (arguably) and 2) Affecting nature in an important way everywhere on earth (almost certainly). This has been called the next major epoch in the history of earth, called the ‘anthropocene’. This class will try to think about what this means: “What is the ‘anthropocene?’” and “What does it mean for the relationship between nature and humans?” “How do we protect nature and provide the resources needed for 10 billion (or so) humans, especially those that have important economic challenges?”. We will focus on the basic element of the biology of both natural and human-controlled ecosystems and see if this can help determine what humans might actually DO to manage their relationship with nature and still provide for human welfare and fulfillment. The class will integrate topics in ecology, conservation, geophysics, human demography, history, economics, and national and international policy.

II. Coursework & Schedule

1. List of Graded Work

Assignment	Description	Requirements	Points
Learning Diary of Sessions	10 minutes of class at the end each day to summarize lecture or discussion and to reflect on its significance. This will be graded for content (60% for summary and 20% for reflection) but also for clarity (20%). We will use your writings to start the next session to catch up and summarize.	200-300 words each time	200 Total (over the semester) (2 lowest scores will be dropped)
Midterm exam	This will cover material covered over the lecture-oriented part of the class (first half of the semester)	Short answer exam format (20 questions)	80
Experiment Objectives and Hypotheses	A written assignment in which you identify the primary objective of our experiment and list your hypotheses	250-500 words	10
Scientific Report	A scientifically written report in which you present your version of the objectives, hypotheses, results, and conclusions of our experiment, and place our research within the broader context involving the challenge of invasive species to humans and native biotas.	2000-2500 words	80

Presentation on Selected Topic	You will research a biodiversity-human issue of your choice (or from a suggested list)	20 minute presentation + 10-15 minute discussion (with you as leader) on the topic	50
Term paper (draft)	You will write up your selected topic as a term paper for feedback.	2000-2500 words	20
Final term paper	You will write up a final term paper on your topic that incorporates the feedback given to your draft	2000-2500 words	110
Participation	You will come to class prepared to contribute to discussions and exchanges of ideas		50
Course total			600
Final exam	There is no final exam, focus on your term paper!		

2. Weekly Course Schedule: Note that this may change as the semester progresses.

Week/ Date	Activity	Topic/Assignment (Question/Subject)
Week 1	Topic	Human population growth and carrying capacity – “are we there yet”?
	Summary	We will look at the data on historical human population trends, including the ‘demographic transition’ and the per-capita impacts of humans on nature.
	Readings/Works	Pope Francis’ 2015 encyclical – “Laudato si” – selected chapters (1, 3 - 6)
	Assignment	‘Learning Diary entry’ (LDE) for each lecture or discussion... (also during the rest of the semester)
Week 2	Topic	The state of health of nature – “just how bad is it? Really...”
	Summary	We will review the science of environmental effects on nature, including loss of biodiversity, loss of ecosystem ‘function’, invasive species, pollution, and habitat fragmentation as well as climate change.
	Readings/Works	Read the 2007 IPCC (International Panel on Climate Change) Summary Report (we will also take a look at more recent IPCC reports but these are less informative).
	Assignment	LDE
Week 3	Topic	How resilient is nature?
	Summary	We will try to pose the question about the Nature-Human conflict as carefully and openly as we can.
	Readings/Works	Chapter 2 (on Easter Island) in J. Diamond’s book... Collapse. Also, report in Ars Technica summarizing ongoing research by Lipo et al. 2020 that questions Diamond’s interpretation.
	Assignment	LDE

Commented [L1]: Reading here? Actually the IPCC report..

Week/ Date	Activity	Topic/Assignment (Question/Subject)
Week 4	Topic	The idea of 'resilience' in nature: Does "she(?)" take care of herself? Designing an experiment to evaluate how invasive species become so.
	Summary	We will look at how fast nature can recover from 'disturbances' (including those due to humans' and if this ability to recover is changing through time.
	Readings/Works	Handout for our experiment – motivation, hypotheses, methods, anticipated analytical methods.
	Assignment	LDE
Week 5	Topic	Field trip to NATL – Water purification in wetlands demo
	Summary	We will go to the demonstration site for wetland water purification at NATL, UF's natural areas for research and teaching. We will also discuss philosophical approaches that question whether 'sustainability' is even a concern for humans.
	Readings/Works	Read Butman, J. 2016. Opinion: Against 'Sustainability'. N. Y. Times https://www.nytimes.com/2016/08/08/opinion/against-sustainability.html
	Assignment	Report on objectives and hypotheses for our experiment
Week 6	Topic	Conservation Biology, what is it? The 'new vs. old-school' schism.
	Summary	We will find out more about 'conservation biology' and debate the two sides of the schism as exemplified by the Hobbs and Murcia articles that focus on 'what' we should try to conserve and 'why'.
	Readings/Works	Read Hobbs et al. 2009 and Murcia et al. 2014. A critique of the 'novel ecosystems' concept. Trends in Research in Ecology and Evolution 29:548-553.
	Assignment	
Week 7	Topic	Invited lectures 1 and how to use the library (invasive species, disease biology), speakers to be arranged.

Week/ Date	Activity	Topic/Assignment (Question/Subject)
	Summary	We will meet with and discuss with them selected topics of particular concern and with local expertise. We will also have a presentation and Q&A with science library faculty on how to use library resources for research.
	Readings/Works	TBA with guest lecturer
	Assignment	LDE
Week 8	Topic	Invited lecture 2 and 3 (disease ecology and biodiversity in agricultural ecosystems, chemical and other pollutants).
	Summary	Identical with last week
	Readings/Works	TBA with guest leturers
	Assignment	LDE
Week 9	Topic	We will measure the outcome of our experiment and see what the data look like.
	Summary	We will take measurements on our experiment and conduct analyses interactively using simple statistical tests in R-markdown
	Readings/Works	Primer on R
	Assignment	Hand in R-markdown worksheet
Week 10	Topic	The economics of biodiversity in nature. How can we reconcile things with human needs
	Summary	So how can we address all this within a human economic framework? To address this, we will carefully read and critically discuss a recent comprehensive evaluation.
	Readings/Works	Dasgupta 2021. The Economics of Biodiversity: The Dasgupta Review pp 11-80.
	Assignment	LDE

Commented [L2]: Here and following... reading TBA with guest lecturers

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Week/ Date	Activity	Topic/Assignment (Question/Subject)
Week 11	Topic	Presentations 1 & 2
	Summary	Students will give presentation on their selected topics and lead discussions
	Readings/Works	
	Assignment	LDE
Week 12	Topic	Presentations 3 and 4
	Summary	Students will give presentation on their selected topics and lead discussions
	Readings/Works	
	Assignment	LDE
Week 13	Topic	Presentations 5 and 6
	Summary	Students will give presentation on their selected topics and lead discussions
	Readings/Works	
	Assignment	LDE, Experiment report due
Week 14	Topic	Presentations 5 and 6
	Summary	
	Readings/Works	
	Assignment	LDE
Week 15	Topic	Roundtable discussion of 'everything', What does the future look like (or can we even tell)?
	Summary	Can we make a synopsis of what we've learned and what it means to us and whether we have consensus or not...
	Readings/Works	

Week/ Date	Activity	Topic/Assignment (Question/Subject)
	Assignment	Term papers due.
	Final	none

III. Grading

1. Statement on Attendance and Participation

Attendance and Participation:

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at: <https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>

- **Participation:** Consistent informed, thoughtful, and considerate class participation is expected and will be evaluated using the rubric below. The instructor will inform you of your participation grade to date when mid-term exams are returned and schedule a conference if you are earning below 70% of the possible points.
- **NOTE:** If you have personal issues that prohibit you from joining freely in class discussion, e.g., shyness, language barriers, etc., see the instructor as soon as possible to discuss alternative modes of participation.

Participation Grading Rubric:

	High Quality	Average	Needs Improvement
Informed: Shows evidence of having read the readings and/or done the assigned work.	Has grasped all the essential material needed for discussions and participation	Has grasped the basic material but shows some important lapses or superficial attention to materials	Shows little to no evidence of having read appropriate materials
Thoughtful: Shows evidence of having understood and considered issues raised.	Has given thought and anticipated how to contribute to the discussions and activities	Is thoughtful of responses to questions and discussions	Shows little interest in the issues raised
Considerate: Takes the perspective others into account.	Engages actively, creatively and respectfully in participating in the class	Is tolerant of the perspectives of others but doesn't show much interest or engagement in other points of view	Is disrespectful of the views of others

3. Grading Scale

For information on how UF assigns grade points, visit: <https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/>

A	94 – 100% of possible points		C	74 – 76%
A-	90 – 93%		C-	70 – 73%
B+	87 – 89%		D+	67 – 69%
B	84 – 86%		D	64 – 66%
B-	80 – 83%		D-	60 – 63%
C+	77 – 79%		E	<60

IV. Quest Learning Experiences

1. Details of Experiential Learning Component

We will do a field trip to UF's Natural Areas Teaching Laboratory. We will focus on the Stormwater Ecological Enhancement Project (SEEP). This area has a trail that illustrates how wetlands can be used to improve water quality in ways that relate to ecosystem functioning and biodiversity. These processes also occur in natural wetlands.

2. Details of Self-Reflection Component

To consolidate the material and reflect on it and what we think about the material we will maintain a Learning Diary that requires that these ideas be written down in narrative and simple form. The last 10 minutes of each meeting will be devoted to starting on this so that the reflection activity is proximal and so that distraction and forgetting are minimized. Students will be encouraged to think about this a bit more outside of class but the entries will be graded by midnite of each session to maximize the value of the activity.

In addition, each student will research a topic, either of their choice or from a proposed list, and make a presentation of the information but also of their perspective on the topic. They will also write up a term paper, in which they will be encouraged to respond to the discussion resulting from their presentation.

V. General Education and Quest Objectives & SLOs

1. This Course's Objectives—Gen Ed Primary Area and Quest

Biological Sciences Objectives →	Quest 2 Objectives →	This Course's Objectives → (This course will....)	Objectives will be Accomplished By: (This course will accomplish the objective in the box at left by...)
Biological science courses provide instruction in the basic concepts, theories and terms of the scientific method in the context of the life sciences.	Quest 2 courses provide instruction in the history, key themes, principles, terminologies, theories, or methodologies of various social or biophysical science disciplines that enable us to address pressing questions and challenges about human society and/or the state of our planet.	...learn about the current state of knowledge about ecological principles that apply to human ecology and to natural ecosystems.	... interactive lectures, readings, and discussions of these principles. It will ask students to illustrate how these principles can inform how humans might address an important environmental issue of their choice.
Courses focus on major scientific developments and their impacts on society, science and the environment, and the relevant processes that govern biological systems.	Students learn to identify and analyze different social or biophysical science methods and theories and consider how their biases and influences shape pressing questions about human society and/or the state of our planet.	... be exposed to ongoing scientific research methods used to address environmental issues such as ecosystem models that forecast environmental change (atmospheric CO ₂ , biodiversity, ecosystem services to humans, diseases) and computationally intensive methods that can address the biodiversity crisis.	... guest seminars by experts at UF that work on these topics as they apply to human welfare.
Students will formulate empirically-testable hypotheses derived from the	These courses emphasize clear and effective analysis and evaluation of qualitative or	Empirically test the effect of selected stressors on stream ecosystems and propose solutions	The class will work as a group to design, conduct and analyze and experiment in aquatic

Biological Sciences Objectives →	Quest 2 Objectives →	This Course's Objectives → (This course will....)	Objectives will be Accomplished By: (This course will accomplish the objective in the box at left by...)
study of living things, apply logical reasoning skills through scientific criticism and argument, and apply techniques of discovery and critical thinking to evaluate outcomes of experiments.	quantitative data relevant to pressing questions concerning human society and/or the state of our planet.		mesocosms that investigates how invasive species alter native biodiversity and ecosystem functions.
Biological science courses provide instruction in the basic concepts, theories and terms of the scientific method in the context of the life sciences.	Students reflect on the ways in which the social or the biophysical sciences impact individuals, societies, and their own intellectual, personal, and professional development.	Encourage students to consider how environmental concerns can influence human welfare in general and for them personally.	Students will be asked to include such reflections in the Learning Diary, the term paper and presentation, and in class discussions.

2. This Course's Student Learning Outcomes (SLOs)—Gen Ed Primary Area and Quest

	Biological Sciences SLOs → Students will be able to...	Quest 2 SLOs → Students will be able to...	This Course's SLOs → Students will be able to...	Assessment Student competencies will be assessed through...
Content	Identify, describe, and explain the basic concepts, theories and terminology of natural science and the scientific method; the major scientific discoveries and the impacts on society and the environment; and the relevant processes that govern biological and physical systems.	Identify, describe, and explain the cross-disciplinary dimensions of a pressing societal issue or challenge as represented by the social sciences and/or biophysical sciences incorporated into the course.	Identify, describe, and explain current scientific knowledge about human population growth and environmental impacts, biodiversity regulation and environmental change, and global ecological factors such as climate change, environmental change and scientific approaches to address the negative effects of humans including conservation biology.	Learning diaries, a midterm exam, and more focused papers and presentations to the class on selected topics.
Critical Thinking	Formulate empirically-testable hypotheses derived from the study of physical processes or living things; apply logical reasoning skills effectively through scientific criticism and argument; and apply techniques of discovery and critical thinking effectively to solve scientific problems and to evaluate outcomes.	Critically analyze quantitative or qualitative data appropriate for informing an approach, policy, or praxis that addresses some dimension of an important societal issue or challenge.	Analyze and Evaluate data on ongoing changes in human populations, environmental change, and on the results of a class experiment on invasive species effects.	Class participation, Objectives and Hypotheses assignment; Scientific Report on mesocosm experiment on invasive species effects.

	Biological Sciences SLOs → Students will be able to...	Quest 2 SLOs → Students will be able to...	This Course's SLOs → Students will be able to...	Assessment Student competencies will be assessed through...
Communication	Communicate scientific knowledge, thoughts, and reasoning clearly and effectively.	Develop and present , in terms accessible to an educated public, clear and effective responses to proposed approaches, policies, or practices that address important societal issues or challenges.	Prepare a presentation and write a reflective term paper on selected environmental topics. Write a scientific report presenting the objectives, hypotheses, methods, results, and implications of an experiment testing the effects of invasive species on native species in mesocosms;	Evaluation of class student presentation to the class and term paper and scientific report.
Connection	N/A	Connect course content with critical reflection on their intellectual, personal, and professional development at UF and beyond.	Reflect on the effects of environmental change on themselves and the welfare of others.	Learning Diary. Participation in class discussions.

VI. Required Policies

1. Students Requiring Accommodation

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting <https://disability.ufl.edu/students/get-started/>. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

2. UF Evaluations Process

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluer.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

3. University Honesty Policy

UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (<https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

4. Counseling and Wellness Center

Contact information for the Counseling and Wellness Center: <https://counseling.ufl.edu/>, 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

5. The Writing Studio

The writing studio is committed to helping University of Florida students meet their academic and professional goals by becoming better writers. Visit the writing studio online at <http://writing.ufl.edu/writing-studio/> or in 2215 Turlington Hall for one-on-one consultations and workshops.

6. Policy on Recordings

Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.