Sustainability Science
SUMA PS5140
Spring 2024
Thursday 6:10-8 pm
601 Fairchild Life Sciences Building

Instructor: Jenna M. Lawrence, Ph.D.
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Course Associate: Camillus Fitzpatrick
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Office hours by appointment

Course Description:
Achieving sustainability requires an understanding of the capacities and dynamics of natural systems, including their long-term ability to produce resources and to assimilate waste. Students will learn not only the fundamentals of how the natural world works, but also how to reconcile the disconnect between human actions and ecological consequences – as well as why managers should care. We will explore the science behind current issues in biodiversity, energy, agriculture, equity, freshwater use, marine conservation, and climate change.

Required text:
Wright RT. Boorse DF. 2017. 13th Edition. *Environmental Science: Towards a Sustainable Future.*

Grading:
Grading will be based on two exams (60%) and a 3000-word review paper examining the science behind a sustainability topic of the student's choosing (40%).

Key due dates for the term paper are as follows:
Feb 22: Topic
March 28: Outline
May 3: Final paper

Students with Disabilities: Please let us know if you are registered with the CC/GS Office of Disability Services or Barnard Center for Accessibility Resources & Disability Services and require special accommodations related to this class. If you have a disability but have not yet contacted the office from your college, please do so as soon as possible. For more information visit http://health.columbia.edu/services/ods

Statement on Academic Integrity: At the request of the administration, we refer students to the University Guide to Academic Integrity and remind students that any breaches of the school honor code will result in a failing grade for this course. https://www.cc-seas.columbia.edu/integrity/dishonesty

Plagiarism will result in a zero for the assignment and possible disciplinary action. If in doubt, ask.

Additionally, use of text-generating software (such as ChatGPT) is not permitted and will be treated as plagiarism.

Diversity Statement

It is our intent that students from all backgrounds and perspectives be well served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that students bring to this class be viewed as a resource, strength, and benefit. It is our intent to present materials and activities that are respectful of diversity: gender identity, sexuality, disability, age, socioeconomic status, ethnicity, race, nationality, religion, and culture.

Syllabus

Session	Date	Topic	Readings (13th edition; additional readings and videos posted on Canvas)
1	1/18	Introduction to sustainability science	Ch. 1, 3, 6, Ch. 22.5
2	1/25	Fundamentals: Biodiversity I (valuing, threats)	Ch. 4
3	2/1	Fundamentals: Biodiversity II (tree of life)	Ch. 4
4	2/8	Fundamentals: Population ecology (interactions within species) and evolutionary forces	Ch. 3-5
5	2/15	Fundamentals: Community ecology (interactions between species)	Ch. 4
6	2/22	Fundamentals: Ecosystem ecology **Paper topic due**	Ch. 3 (pp. 48-53, 62-70), Ch. 5
7	2/29	Sustainability of marine resources I: Eutrophication and invasive species	Ch. 7.4, Ch. 20
8	3/7	**Exam 1**	
	3/14	**NO CLASS**	
9	3/21	Sustainability of marine resources II: Overfishing and aquaculture	Ch. 7.4
10	3/28	Sustainability of agriculture **Paper outline due**	Ch. 12 (also relevant material about pesticides in Ch. 13)
11	4/4	Freshwater issues (surface and groundwater)	Ch. 10
12	4/11	Energy issues (fossil, nuclear, renewable)	Ch. 14-16
13	4/18	Climate change	Ch. 18
14	4/25	**Exam 2**	

FINAL PAPER DUE: May 3rd