

CLIMATE CHANGE ADAPTATION

LARTS 449

Spring 2021

Time: T/TH 12:00-12:50 PM

ONLINE CLASS REMOTE LEARNING USING ZOOM AND Neo LMS

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Office: SB 210

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“Office hours” through zoom or phone by appointment

CLASS SPECIFIC EXPECTATIONS

Catalog Description:

Under climate change, environmental resource management must accept new paradigms for continued delivery of the benefits people obtain from ecosystems. The strategies that worked in the past to manage natural resources may not work in the future. This course will explore adaptive strategies that come with economic, philosophical, and ethical tradeoffs. We will discuss these tradeoffs both quantitatively and qualitatively while providing a solid introduction to climate change through the lens of environmental science.

Educational Objectives:

At the successful completion of Climate Change Adaptation, students are expected to/ be able to:

- 1) Quantitatively describe the general physics behind climate change using mathematical mass-balance equations.
- 2) Quantitatively illustrate the difference between climate variability and climate change.
- 3) Describe historic observations and future projections of climate change.
- 4) Describe the interactions between potential impacts of climate change and the adaptive capacity of a system.
- 5) Illustrate the difference between resistance, resilience, and transformation strategies.
- 6) Communicate and defend a climate change adaptation strategy in your local community or the community you grew up in centered around a climate vulnerable natural resource system.

Course Materials:

- Hansen & Hoffman. 2011. 'Climate Savvy Adapting Conservation and Resource Management to a Changing World'. ISBN-9781597266864. Island Press. (~\$40 on Amazon & on-reserve in NEC library).
- Open Source Physics Text. <https://openstaxcollege.org/textbooks/college-physics> (\$free)
- Janowiak et al. 2018. New England and New York Forest Ecosystem Vulnerability Assessment and Synthesis: a report from the New England Climate Change Response Framework <https://forestadaptation.org/ne-assessment> (\$free)
- Additional recent primary literature (\$free).

Field Trip(s):

~~Weather dependent field trip(s) to Boston climate adaptation sites will be coordinated within regular class time to observe climate adaptation management strategies and tactics. These field trips will provide students opportunities to see some of the challenges and solutions that Boston is exploring regarding climate change adaptation.~~

Unfortunately, we won't do any in-person field trips this term due to the remote-learning aspect of the class, however we will replicate as much field time as possible.

Evaluation of student work:

The student's final grade as an evaluation of learning will be based on the following components:

- 20% Written summaries based on in class discussions and reading of climate adaptation current events.
- 20% Periodic quizzes/Assignments based on readings and class material
- 20% Midterm exam
- 20% Final exam
- 20% Written 4-5 page essay defending a climate change adaptation strategy in your local community or the community in which you grew up, centered around a climate vulnerable natural resource system. Essay will be written over the length of the semester with an outline due at the beginning, a first draft evaluated in the middle, and the final draft due at the end of the semester. Components should include why your chosen natural resource system is important, the threats to that system due to climate change, a review of the potential adaptation strategies, a selected strategy that you feel is best, and references listed.

Written summaries

Throughout the semester, we will have several small group discussions surrounding an issue, article, or website. Everyone will read the article/website and we'll discuss this in small groups. Within each small group (A, B, C, D), a discussion leader (selected ahead of time) will be responsible for keeping the group focused having prepared at least four discussion questions. I have given some starter questions but students should not limit themselves to these. It is important that during the group discussions, the leader makes a point of getting feedback from everyone in the group. Throughout the semester, each student will have at least one chance to be a discussion

leader. After the class discussion, each discussion leader will submit a written summary of the article and group discussion. The summary should be between 700 and 900 words.

DRAFT SUMMARY TOPICS

- A) CLIMATE EVIDENCE. We'll have a class discussion about climate change evidence based on reading the following website: <https://climate.nasa.gov/evidence/>. Be sure you understand the graphics and discuss what may be confusing. Make sure your questions to your group include what evidence do you think is most convincing?
- B) EMISSION SCENARIOS. We'll discuss emission scenarios based on the following article: <https://www.theguardian.com/environment/climate-consensus-97-per-cent/2013/aug/30/climate-change-rcp-handy-summary>. Make sure your questions include, what emission scenario do you think is most likely? Also, make sure that everyone in your group understands each graph. Perhaps have your members practice explaining the graphs to each other.
- C) DUTCH SOLUTIONS: We'll have a class discussion about an article describing a Dutch solution to climate change: Article (Kimmelman 2017 found in Neo LMS under 'Resources'). Be sure to discuss if you think these solutions would work in a city like Boston. Why or why not?
- D) RELOCATING A TOWN. We'll discuss an article describing a transformation strategy involving two different towns. Article: Bagri (2017) found in Neo LMS under 'Resources'. Be sure to discuss if you think these transformations were a good idea. What makes each town's problems unique and challenging?

Draft Course Schedule (subject to change)

Week Date	Topic	Reading due before first class of week	Current Issues Reading for Discussion	Assignments Due
1 1/26-1/28	Introduction to Climate Change Adaptation	Hansen & Hoffman Ch 1 & 2		Quiz 1 Introductions
2 2/2-2/4	Introduction to Climate Change Evidence and effects		Climate Change Evidence Article https://climate.nasa.gov/evidence/	
3 2/9-2/11	Climate Variability and	Hansen &	Emissions Article https://www.theguardian.com/environment/climate-	Group A Discussion

	Climate Change (earthgames.org)	Hoffman Ch 7	consensus-97-per-cent/2013/aug/30/climate-change-rcp-handy-summary	Summary
4 2/16 (no class Tuesday)- 2/18	Assessing Vulnerability to Climate Change	Hansen & Hoffman Ch 5	Chapter 5 & 6 of Regional Climate Change Vulnerability Assessment report https://forestadaptation.org/ne-assessment	Group B Discussion Summary
5 2/23-2/25	Resistance Strategies	Hansen & Hoffman Ch 3	Kimmelman 2017 (Find article under 'Resources')	Final essay outline
6 3/2-3/4	Resilience Strategies	Hansen & Hoffman Ch 4	(TBD) Measuring resilience article	Group C Discussion Summary
7 3/9-3/11	Transformation Strategies	Hansen & Hoffman Ch 6	Bagri (2017) (Find Article under 'Resources')	MIDTERM
8 3/16-3/18	Virtual "Field trip" to Boston climate adaptation site, (details to be determined) in order to observe climate adaptation management actions in the field.	Hansen & Hoffman Ch 8-9	(TBD) Forest Reserve Article	Group D Discussion Summary
9 3/23-3/25 (No class Thursday)	Reserves, Connectivity, & Corridors	Hansen & Hoffman Ch 10-11	(TBD) Managing for complexity article	
10 3/30-4/1	Invasive Species	Hansen & Hoffman Ch 12	(TBD) Novel Ecosystems article	Discussion summary on connectivity.
11 4/6-4/8	Regulating harvest and pollutants	Hansen & Hoffman Ch 13-14	(TBD) Air pollutant article	Draft of essay due

12 4/13-4/15	Virtual "Field trip" to Boston climate adaptation site, (details to be determined) in order to observe climate adaptation management actions in the field.	Hansen & Hoffman Ch 15-16	(TBD) Co-benefits of reducing emissions article	Discussion summary on regulating harvests and pollutants.
13 4/20-4/22	Class debate of climate adaptation strategy			
14 4/27-4/29	Future Challenges to Climate Adaptation			Final Essay due.
15 5/4-5/6	Review & Final Exam			FINAL EXAM

DUVENECK SPECIFIC EXPECTATIONS

All course components will be graded on a percentage basis, adding to 100%. Final grades will be assigned according to the scale below:

93	to	100	A
90	to	92	A-
87	to	89	B+
83	to	86	B
80	to	82	B-
77	to	79	C+
73	to	76	C
70	to	72	C-
63	to	69	D
0	to	62	F

Additional Student Expectations:

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- Reading of assigned materials prior to class is expected. Short writing assignments, periodic quizzes and or discussion summaries over assigned reading can be expected and will count toward the Preparation / Participation grade.

- Note taking is necessary during each class. Notes and handouts should be kept organized.
- Respect the classroom, fellow students, and faculty.
- No cell phones during class time.
- Active participation and critical thinking is necessary (and more fun!)
- Formally or informally, please communicate to me *your* specific personal expectations for this class and *your* specific learning styles that work and do not work for you.

Attendance

For all Liberal Arts classes, absence from more than three classes results in a failing grade. Note that arriving to class late by fifteen minutes (or more), or leaving class fifteen minutes early, on *three* occasions will count as one absence. Missing class for a performance opportunity, illness, or personal day counts as an absence. Longer term absences due to a significant performance opportunity can be excused upon written request by your studio teacher. Likewise, a longer term illness can be excused with documentation from a health professional. However, students who miss more than six classes for any reason, excused or unexcused, must withdraw or else they will fail the course.

When you are absent for any reason, you are responsible for finding out what happened during class and for turning in the work required for that day.

Communication:

Please stop by my office hours or set up an appointment at any time during the semester to talk about the readings, your writing assignments, or any other questions or concerns you have about the class. Although I may not always be able to respond immediately, email is the best way to reach me outside of class and office hours. Check your NEC email daily for special announcements; check the class website for regular assignments, announcements, and other important information.

NEC SPECIFIC EXPECTATIONS

Academic Honesty

Plagiarism (or Academic Dishonesty) is any attempt by a student to represent the work of another as his or her own. This includes copying the answers of another student on an examination or copying or substantially restating the work of another person in an oral or written work without citing the appropriate source (e.g., pasting text from the Internet into your paper without quotation marks or without citing the source), as well as simply having another person write your paper for you. Anyone caught plagiarizing will automatically fail the class and could be suspended from NEC.

Writing Center

In addition to seeing me for extra help in the course, I encourage you to visit NEC's Writing Center for free individual writing and academic strategy consultations. WLC sessions are intensive and productive but never intimidating—feel free to schedule a visit for help with any stage of the writing or reading process or to discuss strategies regarding any aspect of your learning. To schedule an appointment, email

<writing@necmusic.edu>.

Disability Support Services:

New England Conservatory is committed to providing all students equal access to its programs and activities. Students with documented disabilities of any kind should register with the Disability Support Services (DSS) office located in the Office of Student Services (SB 224) to learn about accommodations. DSS will work with faculty to design individualized accommodation plans for students who have provided documentation from licensed medical professionals. To set up an appointment with DSS, please email DSS@necmusic.edu.

Title IX / Sexual Harassment

As a faculty member, I am classified as a Responsible Employee by NEC. That means that if you disclose specific information about sexual misconduct that occurred to you or anyone else connected to the NEC community, I will need to report it to NEC's Title IX Coordinator. I wanted you to be on notice of my role and obligation in this matter.

If you have any questions, please contact me or refer to NEC's policy on sexual misconduct and sexual- or gender-based discrimination or harassment at <https://necmusic.edu/title-ix>.

Family Educational Rights and Privacy Act (FERPA)

The Family Educational Rights and Privacy Act of 1974 (commonly referred to as the "Buckley Amendment" or "FERPA") is designed to protect the confidentiality of the records that educational institutions maintain on their students and to give students access to their records to assure the accuracy of their contents. FERPA affords you certain rights with respect to your education records. Information on FERPA and your rights as a student are available on NEC's website at the following link: <http://necmusic.edu/ferpa>.

NEC Mission & Core Values

Mission Statement: New England Conservatory educates and trains musicians of all ages from around the world, drawing on the talent and deep reservoir of experience of our distinguished faculty. We are dedicated to inculcating the highest standards of excellence and nurturing individual artistic sensibility and creative growth. Understanding that music is one of the transcendent expressions of human civilization, NEC aspires to ensure it a central place in contemporary society.

NEC's Mission & Core Values are published on NEC's website at the following link: <http://necmusic.edu/mission-statement>

Definition of an NEC-Educated Person (Bachelor's Degree Level) October 2019

Overview: NEC's Bachelor of Music curriculum is designed with the expectation that an NEC educated person will be a musician with artistic integrity, an active life-long learner in both musical and academic disciplines, and a responsible citizen. The full definition of an NEC-Educated Person can be found [here](#).