CLIMATE CHANGE MINOR

College of Agriculture and Life Sciences, College of Arts and Sciences, College of Engineering

Program Website (https://www.engineering.cornell.edu/eas/degree/climate-change-minor-requirements/)

Program Description

Climate change is one of the most pressing issues of our time, and dozens of courses at Cornell explore the many facets of a warming world—from impacts on farming and food, to the causes of climate change, from the potential of sustainable energy to replace fossil fuels, to the slow response of governments worldwide. The climate change minor gives students the opportunity to explore climate change from varied disciplinary perspectives while gaining a firm grounding in the basic physical, ecological, and social science as well as its interactions with history, philosophy and the arts. Based in the College of Agriculture and Life Sciences, the minor is available to all Cornell undergraduates.

The minor is offered collaboratively with classes across campus coordinated by Peter Hess (BEE/CALS), Christy Goodale (EEB/A+S), Natalie Mahowald (EAS/ENG), and Karen Pinkus (COML/A+S). This coordinating committee can add or subtract courses from this list, based on proposals by professors or students. The minor is administered by the Department of Earth and Atmospheric Sciences.

During your final semester (or earlier if you have already completed your minor requirements), you should submit a completed climate change minor certification form to Annmarie Card in 2102A Snee Hall for approval. We have an email list with special events for climate change minors, so please email us to put your name on the list. Please contact Annmarie Card (https://catalog.cornell.edu/programs/climate-change-minor/ac2666@cornell.edu) with any questions about the minor certification process and to obtain the climate change minor certification form.

Contacts:
Curricular topics: Natalie Mahowald (nmm63@cornell.edu)
Administration: Annmarie Card (ac2666@cornell.edu)

Minor Requirements

Many courses across Cornell deal with the multi-facets of climate change. The minor is structured such that students without prerequisites can obtain the minor, thus enabling students from most any major at Cornell to obtain the minor.

This minor requires that students completes 18 credits of appropriate coursework as follows:

1. BEE 2000 Perspectives on the Climate Change Challenge (1 credit spring seminar consisting of public lectures on climate change)
2. **At least one course in each of the following categories:**
   - Category 1: Physical Science Behind Climate Change
   - Category 2: Ecosystems and Climate Change
   - Category 3: Humans and Climate Change
3. **Additional courses to meet the 18 credits requirement, chosen from the broad list (Categories 1-4) below.**
   Only one course at the 1000 level can count for the minor, and at least 15 credits must be at the 3000 level or higher.

Note:

Students enrolled before Fall 2022 must use the old minor requirements including courses. (https://www.eas.cornell.edu/eas/programs/undergraduate-programs/undergraduate-minors/climate-change-minor/climate-change-minor/)

Categories

Category 1: Physical Science Behind Climate Change

Code	Title	Hours
EAS 4800	Atmospheric Chemistry: From Air Pollution to Global Change (crosslisted)	3
EAS 4443	Global Climate Change Science and Policy (crosslisted)	3
EAS 2680	Climate and Global Warming	3
EAS 3030	Introduction to Biogeochemistry (crosslisted)	4
EAS 3050	Climate Dynamics	3
EAS 4860	Tropical Meteorology and Climate	4

Category 2: Ecosystems, Water Resources and Climate Change

Code	Title	Hours
Water Resources		
BEE 3710	Physical Hydrology for Ecosystems	3
BEE 4730	Watershed Engineering	4
BEE 6740	Ecohydrology	3
NTRES 3240	Sustainable, Ecologically Based Management of Water Resources	3
Ecosystems and Agriculture		
BIOEE 1610	Introductory Biology: Ecology and the Environment	3-4
BIOMI 3500	Marine Microbes and Disease in a Changing Ocean	3
BIOEE 4780	Ecosystem Biology and Global Change	4
NTRES 3220	Global Biodiversity	3
EAS 3340	Microclimatology	3
PLSCI 4290	Remote Sensing and Modeling for Ecosystems	3

Category 3: Humans and Climate Change

Code	Title	Hours
Economics and Policy		
AEM 2555	Corporate Sustainability	3
AEM 4090	Environmental Finance and Markets	3
BSOC 3311	Environmental Governance	3
Understanding the Context		
AMST 2581	Environmental History	4
ANTHR 2482	Anthropology of Climate Change	3
ANTHR 2729	Climate, Archaeology and History	3
CLASS 3750	Introduction to Dendrochronology	4
ENGL 3795	Communicating Climate Change	3
HIST 4262	Environmental Justice: Past, Present, Future	4
NTRES 3330	Ways of Knowing: Indigenous and Place-Based Ecological Knowledge	3
Solutions: Mitigation, Adaptation and Remediation		
ENGRI 1165	Climate Change and You, the Engineer	3
CRP 5545	Urban Adaptation to Climate Change	3

EAS 4441	Controversies in Global Climate Change Science and Policy	1.5
EAS 4443	Global Climate Change Science and Policy	3

Category 4: Additional Climate Change Courses

Code	Title	Hours
BEE 2010		3
CEE 4210	Renewable Energy Systems	3
CEE 4640	Sustainable Transportation Systems Design	3
EAS 1101	Climate and Energy: a 21st Century Earth Science Perspective	3
ANSC 4880	Global Food, Energy, and Water Nexus – Engage the US, China, and India for Sustainable Future	3-4

Note

Students should pay close attention to prerequisite information for all courses listed above.

If a student would like a new course to be considered for the minor, they should email Professor Natalie Mahowald (nmm63@cornell.edu) and Annmarie Card (ac2666@cornell.edu) with the course syllabus and a statement from the student indicating that at least 30% of the course content is about climate change. Only Cornell classes, and some transfer classes, count towards the minor. AP credit cannot be used towards the minor. No more than 3 unstructured credits can count towards the minor.

Academic Standards

Must have a C- in each course taken for a letter grade, or, for Satisfactory/Unsatisfactory courses, it must be Satisfactory.

Graduation Requirements for Engineering Minor Degree Programs

Requirements

Students may pursue minors in any department in any college that offers them, subject to limitations placed by the department offering the minor or by the students' major. Completed minors will appear on the student's transcript. Not all departments offer minors. Additional information on specific minors can be found above, in the *Engineering Undergraduate Handbook*, in the undergraduate major office of the department or school offering the minor, and in Engineering Advising.

An engineering minor recognizes formal study of a particular subject area in engineering normally outside the major. Students undertaking a minor are expected to complete the requirements during the time of their continuous undergraduate enrollment at Cornell. Completing the requirements for an engineering minor (along with a major) may require more than the traditional eight semesters at Cornell. However, courses that fulfill minor requirements may also satisfy other degree requirements (e.g., distribution courses, advisor-approved, or major-approved electives), and completion within eight semesters is possible.

An engineering minor requires:

- successful completion of all requirements for an undergraduate degree.
- enrollment in a major that approves participation in the minor.
- satisfactory completion of six courses (at least 18 credits) in a college-approved minor.

Students may apply for certification of a minor at any time after the required course work has been completed in accordance with published standards. An official notation of certification of a minor appears on the Cornell transcript following graduation.

Learning Objectives

- Describe the physical mechanisms that underlie climate change and the drivers of uncertainty in the future climate projections.
- Recognize how climate forces change in ecosystems and agriculture, and how these can further amplify or mitigate climate change forcings.
- Explain how humans interact with climate change, including historical, social science perspectives, mitigation and/or adaptation solutions.
- Synthesize and communicate the multi-disciplinary complexities and uncertainties in the possible solutions to climate change.