CLIMATE SCIENCE, CERTIFICATE

Climate change represents one of the most controversial and least understood threats to human, economic and environmental well-being on a global scale. The study of climate science offers an opportunity to develop the skills and effective policies to reduce risk and better adapt to a changing environment. In this 4-course, 4 c.u. certificate you gain an understanding of the Earth's climate system and how and why it has changed over time. Within the disciplines of oceanic and atmospheric science, you focus on the mechanisms that drive climate science, both natural and the result of human actions. You also develop the communication skills to more effectively share an understanding of climate science and its relevant policy implications with a broad audience.

Climate Science Certificate Requirements

- The Certificate in Climate Science is a 4-course, 4 c.u. credit program of study taught by University of Pennsylvania faculty.
- To earn a certificate, students complete any four courses offered, in any order. See courses below.

Flexible Course Schedule

Penn LPS Online courses in the Certificate in Climate Science are offered on an accelerated (8-week) schedule. Courses in the online certificate program are largely asynchronous with some optional synchronous sessions to be scheduled by the instructors. All Penn LPS Online courses are taught at the undergraduate level by Penn instructors.

You have the option to enroll in individual climate science courses without committing to the entire online certificate, enjoying the flexibility and expertise offered by Penn LPS Online to suit your schedule and interests.

Read more about the Certificate in Climate Science. (https://lpsonline.sas.upenn.edu/academics/certificates/climate-change/)

The Certificate in Climate Science prepares you to:

- Reconstruct the history and scales of climate changes
- Learn basic atmospheric and ocean dynamics to understand fundamental climatic processes and future changes
- Examine the mechanisms that act to drive climate change
- Analyze long-term natural climate variability on a global and regional scale
- Understand the importance of natural environmental change as a benchmark against which to assess human impacts, recent climate change, and future environmental change
- Deepen insights into methods of scientific inquiry
- Refine communication skills to effectively share an understanding of climate science, with a focus on both science and policy implications

Curriculum

Students must complete CLCH 1600: Oceanography plus any three additional climate science courses from the list below to earn a Certificate in Climate Science. Although it is recommended that students take CLCH 1600: Oceanography first, students can start with any course and take them in any order.

Code	Title	Course Units
Climate Science Certificate		
CLCH 1600	Oceans and Climate	1
Select 3 CU from the following:		3
CLCH 2100	Introduction to Disaster Management	
CLCH 2200	Atmospheric Science	
CLCH 2300	Climate Change	
CLCH 3000	Communicating Science	
CLCH 3100	Global Environmental Issues	
GLBS 3000	Global Public Health: Climate Change and Public Policy	
Any course with Attribute = BCCC (https://catalog.upenn.edu/attributes/bccc/)		
Total Course Units		**4**

Courses are subject to change.

The degree and major requirements displayed are intended as a guide for students entering in the Fall of 2026 and later. Students should consult with their academic program regarding final certifications and requirements for graduation.

Climate change is already having a devastating impact on human populations globally. Climate migration due to crop failures can lead to political instability. Sea level rise is pushing populations inland putting pressure on delicate ecosystems and endangered species. Heat waves are placing pressure on healthcare systems while increased storms lead to flooding and widespread damage which has stressed the resources of disaster management organizations. Disease vectors such as malaria and dengue fever are moving into new regions as average daily temperatures rise globally. These challenges not only impact public health but disrupt the functioning of factories and their supply chains. This Advanced Certificate in Climate Science is designed to help everyone from school teachers, to community organizers, to politicians and CEO's of major manufacturing organizations to understand what to expect as climate continues to change and to find solutions through policy and human ingenuity to the myriad of problems we will face in the next decade.

The Advanced Certificate in Climate Science is a 6 course unit program of study taught by the University of Pennsylvania faculty. To earn an advanced certificate, students must complete all six climate science courses offered.

Penn LPS Online courses in the Certificate in Climate Science are offered on an accelerated (8-week) schedule. Courses in the certificate program are largely asynchronous with some optional synchronous sessions to be scheduled by the instructors. For more information about specific course dates, please visit the Course Schedule (https://lpsonline.sas.upenn.edu/academics/course-schedule/) page.

Read more about the Certificate in Climate Science. (https://lpsonline.sas.upenn.edu/academics/certificates/climate-change/)

The Advanced Certificate in Climate Science prepares you to:

- Gain a detailed understanding of the state of climate science and how to critically evaluate new research results
- Think critically about the impacts of global climate change to plan for and mitigate potential future disasters
- Acquire a good understanding of global climate policy and how it is influenced by culture, religion, geography, and GDP.
- Communicate the science, policy and impacts of climate change to a broad audience using various communication styles including white papers, blogs, and podcasts.

Students with an Advanced Certificate in Climate Science will be better prepared to lead non-profit groups looking to obtain grants to improve infrastructure in their communities to prepare for floods, heat waves, wildfires and other climate impacts; understand the potential impacts to their companies including supply disruptions, electrical outages and employee health concerns; work with government officials to develop policy to mitigate future disasters and health crises; and educate others on the future climate impacts we will face as a species.

Curriculum

Certificate students who complete any four of the online courses listed below earn a Certificate in Climate Science. Those students are then eligible to pursue an Advanced Certificate in Climate Science by taking two additional Climate Science courses.

Code	Title	Course Units
Climate Science Certificate		
Select two of the following not used for the Basic Climate Science Certificate		2
CLCH 1600	Oceans and Climate	
CLCH 2100	Introduction to Disaster Management	
CLCH 2200	Atmospheric Science	
CLCH 2300	Climate Change	
CLCH 3000	Communicating Science	
CLCH 3100	Global Environmental Issues	
GLBS 3000	Global Public Health: Climate Change and Public Policy	
Any course with Attribute = BCCC (https://catalog.upenn.edu/attributes/bccc/)		
Total Course Units		**2**

Courses are subject to change.