

# CLIMATE AND ENVIRONMENTAL CHANGE, CERTIFICATE

Requirements for an undergraduate certificate may be completed at any campus location offering the specified courses for the certificate.

## Program Description

The Climate and Environmental Change Certificate is intended for students seeking to understand the spatial patterns and physical processes of climate change and variability, and to hone their skills of environmental data collection, analysis, and interpretation. Upon completing this certificate, students will be able to explain the environmental processes and patterns associated with climate change; identify and distinguish between natural climate variations and observed processes of climate change; utilize data from field experiments, satellite and aerial imagery, observation archives, and computer modeling to analyze climate change patterns across space.

## Program Requirements

| Code  | Title  | Credits |
|---|--|---------|
| <b>Required Courses</b>   |  |         |
| <i>Required Courses: Require a grade of C or better</i>   |  |         |
| GEOG 310  | Introduction to Global Climatic Systems                      | 3       |
|   | or GEOG 310W Introduction to Global Climatic Systems         |         |
| Select 9-10 credits from the following (may not choose more than 1 course from GEOG 362, GEOSC 482, or METEO 477) |  |         |
| EARTH 402   | Modeling the Earth System                                    |         |
| GEOG 362  | Image Analysis   |         |
| GEOG 410  | Climatic Change and Variability                              |         |
| GEOG 412W   | Climatic Change and Variability                              |         |
| GEOG 417  | Satellite Climatology  |         |
| GEOG 438W   | Human Dimensions of Global Warming                           |         |
| GEOSC 320   | Geology of Climate Change                                    |         |
| GEOSC 450   | Risk Analysis in the Earth Sciences                          |         |
| GEOSC 482   | Satellite Remote-Sensing For Earth Observation               |         |
| METEO 436   | Radiation and Climate  |         |
| METEO 469   | From Meteorology to Mitigation: Understanding Global Warming |         |
| METEO 470   | Climate Dynamics   |         |
| METEO 477   | Fundamentals of Remote Sensing Systems                       |         |

## Non-Course Requirements

Prerequisites not included in certificate:

- EARTH 402 Prerequisites: (EARTH 2 or EARTH 103) and (CHEM 110) and (MATH 83 or MATH 110 or MATH 140)
- GEOG 310/GEOG 310W Prerequisite: GEOG 10 or GEOG 210 or METEO 3 or METEO 101 or METEO 201
- GEOG 362 Prerequisite: GEOG 160 or GEOG 260
- GEOSC 450 Prerequisites: introductory Earth Science or Geosciences course and introductory statistics course and (MATH 110 or MATH 140)
- METEO 436 Prerequisite: METEO 300, concurrent: METEO 431

- METEO 469 Prerequisite: STAT 200 or MATH 110 or MATH 140
- METEO 470 Prerequisites: METEO 300, METEO 421, METEO 431
- METEO 477 Prerequisite: METEO 436 or EE 330

Per University policy, all credit courses for a certificate require a grade of 'C' or higher, and at least two-thirds (2/3) of the credits used to complete a certificate must be earned at Penn State. If student is completing multiple certificates in Geography (including Global & Environmental Change), no more than one (1) course may double-count for each.

## Academic Advising

The objectives of the university's academic advising program are to help advisees identify and achieve their academic goals, to promote their intellectual discovery, and to encourage students to take advantage of both in-and out-of class educational opportunities in order that they become self-directed learners and decision makers.

Both advisers and advisees share responsibility for making the advising relationship succeed. By encouraging their advisees to become engaged in their education, to meet their educational goals, and to develop the habit of learning, advisers assume a significant educational role. The advisee's unit of enrollment will provide each advisee with a primary academic adviser, the information needed to plan the chosen program of study, and referrals to other specialized resources.

READ SENATE POLICY 32-00: ADVISING POLICY (<http://senate.psu.edu/policies-and-rules-for-undergraduate-students/32-00-advising-policy>)

## University Park

### Jodi Vender

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## Contact

### University Park

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