

## **Graduate Certificate Proposal in Climate Change and Health Information for Prospective Students**

### **Overview**

The Graduate Certificate in Climate Change and Health (GCeCCH) certificate program is open to currently-matriculated students in any UW graduate program. The curriculum includes one required three-credit graduate course in climate change and health and one required three-credit graduate course in climate science; at least two electives outside the student's primary discipline; and a five-credit Capstone Experience tailored to the student's interests. The required core courses provide an overview of climate change from the perspectives of Earth science and public health, health issues associated with climate change, relevant methods in health and other sciences, and an introduction to important perspectives from other disciplines. The electives include courses from a wide range of other disciplines at UW that provide relevant complementary perspectives, including those from Earth and atmospheric sciences, geography, policy, social work, life and environmental sciences, the built environment, and other areas. The Capstone Experience will provide a mentored opportunity to explore a climate and health topic more deeply and experience an interdisciplinary approach to the characterization or management of a climate and health concern.

### **Relationship to Institutional Role, Mission, and Academic Unit Priorities**

The Center for Health and the Global Environment (CHanGE) was founded as a strategic initiative through the School of Public Health to engage departments and academic units from all over campus around Global Change research, training, and practice. Our mission includes teaching the next generation of leaders about research and practice in the discipline of Climate and Health. Our strategic objectives include developing courses and other academic offerings to engage students at all levels and across a wide range of disciplines. We currently have both an undergraduate course and a graduate course and provide content to a number of other professors' courses around campus. Our activities intersect with a number of priority areas in the Population Health Initiative. The graduate certificate would bring together students from across campus (public health, medicine, physical sciences, law, policy, environment, urban planning, etc.) and promote innovative and original research and practice on this important topic that is a high priority for the university overall.

## Curriculum

### Summary Table

|                  |                    |                       |
|------------------|--------------------|-----------------------|
| Core Course I    | 3 credits          | GH/ENV H 518          |
| Core Course II   | 3 credits          | ATMS S 587            |
| Electives        | At least 4 credits | See attached list     |
| Capstone Project | 5 credits          | ENV G/GH/ATMS/OCN 600 |

### Core (required) Courses

Two core classes for a total of six credits are required. The first is GH/ENV H 518, "Understanding and Managing the Health Risks of Climate Change" (3 credits). The second is ATM S 587, "Fundamentals of Climate Change" (3 credits).

### Electives

At least two electives outside the student's primary discipline, for a minimum of 4 credits, are required. For instance, if a student is enrolled in the Global Health Master's in Public Health program, the two electives should be outside of Global Health. Please see attached for a list of available elective courses and their credits. At least one elective should be in the School of Public Health (SPH) and one should be outside SPH.

### Capstone

The capstone is a hands-on activity focused on climate and health. While capstone projects will vary depending on the stakeholders and organizations involved, all projects will include:

- substantial interaction with stakeholders to clarify their needs regarding climate and health research and practice;
- development of an applied project that responds to stakeholder needs; projects can include a focused research effort, literature review, development of a curriculum, development of a communication tool, or other activity that will be responsive to the stakeholder's needs;
- preparation of a detailed a final report, including any materials, presentations, and other products related to the project; and
- close mentorship by certificate faculty and involved stakeholders throughout the project.

While projects will vary, common competencies that students will develop through the capstone include:

- organizational needs assessment
- translation of needs into priorities and action items using logic frames and other tools
- implementation science skills such as development of outcomes, indicators, and metrics
- skills in searching, reviewing, and synthesizing scientific and practice-based literature
- anticipation and negotiation of organizational barriers and constraints in climate change adaptation
- communication of scientific information to lay audiences
- preparation of scientific documents for community and practice-based stakeholders and for scientific audiences
- development of figures or graphics to facilitate communication of scientific findings related to climate and health

Capstones can be done individually or in groups, and group projects can be done with students in other graduate certificate programs (e.g. students in the Program on Climate Change Graduate Certificate in Climate Science). If a group project is pursued, students need to articulate their individual roles and contributions to the effort in their final report. For the capstone, students will articulate interests and goals for their capstone projects and will be assisted by CHanGE faculty and affiliates in identifying partner organizations. Together the student, faculty, and stakeholder mentors will develop goals and objectives for the capstone experience that will be entered into a tracking form for the capstone project. Certificate faculty will be the primary mentors during the capstone experience, in close coordination with partner organization contacts. The project is expected to take approximately 150 hours. It can be satisfied through ENV H 600 (5 credits), GH 600 (5 credits), or ATMS/OCN/ESS 596 (5 credits). The project may span more than one quarter. Students will be evaluated based on their steady progress toward stated objectives and on the final product. Students will receive narrative evaluations from their certificate faculty and organizational sponsors. The student's file will be updated with the tracking form, products from the capstone project, and narrative evaluations upon capstone project completion.

## **Student Learning Outcomes**

GCeCCH holders will be able to:

1. Describe the general science behind climate change, list the principal sources of greenhouse gas emissions, and rank different sectors regarding the magnitude of their contributions to climate change
2. Articulate the linkages between climate change and health and elaborate on the causal pathways linking specific climate-related exposures and associated health outcomes
3. Explain the use of emissions scenarios in projecting climate change environmental impacts using global circulation models and discuss how scenarios relate to projections of health impacts
4. Recount the likely trajectory of climate change over the course of the 21<sup>st</sup> century and assess the likely health impacts associated with differing degrees of warming
5. Describe the principal methods used to characterize associations between climate-related exposures and associated health effects, the methods used to conduct surveillance of current climate change health impacts, and the methods used to project future climate change health impacts
6. Criticize the methods outlined above with particular emphasis on threats to validity and with regard to uncertainty and its management
7. Describe the distribution of climate change health impacts and contrast this distribution with that of historical greenhouse gas emissions
8. Characterize the role of integrated assessment models in projecting climate change-related damages and social costs
9. Define climate change adaptation, describe how adaptation is pursued in the public health sector, and report on the state of climate change adaptation in the US and other areas including the use of indicators and public health surveillance
10. Define climate change mitigation and characterize the importance of the health co-benefits of mitigation activities, how these cobenefits are quantified, and the state of co-benefits research

11. Describe the difference between hazards and risks and the factors affecting vulnerability
12. List the hallmarks of a complex system, describe adaptive management, and relate how adaptive management can be used to iteratively adapt to pressing climate and health concerns
13. Summarize the role of risk management in climate change mitigation and adaptation and apply risk management principles to the public health response to climate change
14. Outline the major international scientific and policy bodies focused on climate change, relate important milestones in climate change policy domestically and internationally, and report on the current status of domestic efforts to enact commitments the US has made internationally

### **Governance and Faculty Involvement**

The certificate will be administered through the Department of Environmental and Occupational Health Sciences and co-sponsored by EOHS and Global Health. Dr. Kris Ebi and Dr. Jeremy Hess will co-direct the certificate program. Faculty for advising students in their Capstone Experiences will include Drs. Ebi and Hess as well as members of the Center on Health and the Global Environment (CHanGE); please see [CHanGE website](#) for a list of current members.

### **Admission Process, Student Tracking, and Granting Certificates**

Students intending to pursue the GCeCCH should complete an application and forward to the Center for Health and the Global Environment (CHanGE) coordinator at [chge@uw.edu](mailto:chge@uw.edu). Students will be accepted into the GCeCCH based on strong prior scholastic performance in relevant undergraduate and graduate courses and should submit undergraduate and graduate transcripts and a letter of support from someone who has worked closely with the student in an academic or other capacity with their application. CHanGE's program manager will manage admissions, track student progress and with help of DEOHS academic staff, submit the request to Graduate Management Services in the Graduate School for granting of the certificate.

## **Admission Standards**

Prerequisites include admission to the graduate program of (a) Environmental Health (ENV H), (b) Global Health (GH), or (c) another University of Washington graduate program with at least three quarters (2 semesters) of undergraduate or graduate coursework in geophysical science, chemistry, biology, physics, and/or health sciences with an average grade of B (3.0). Students must demonstrate an interest in the public health effects of climate change.

## **Grading/Assessment and Minimum Standards**

Successful completion of the Certificate Program requires a minimum cumulative GPA of 3.0 and a grade of 2.7 or higher for each course counted toward the certificate. Student capstone activities will be evaluated as outlined above.

An annual survey will be sent to enrolled students and selected faculty to evaluate the certificate program content, leadership, and capstone experience. Elective courses will be evaluated on an annual basis by directors to assure program quality.

## **Transcript Title**

Certificate in Climate and Health

## Graduate Certificate in Climate Change and Health – Checklist

- Minimum cumulative graduate school GPA  $\geq 3.0$
- Core Course 1: GH/ENV H 518 with grade  $\geq 2.7$
- Core Course 2: ATMS S 587 with grade  $\geq 2.7$
- Elective 1 (2+ credits, may be in SPH): \_\_\_\_\_ with grade  $\geq 2.7$
- Elective 2 (2+ credits, must be outside SPH): \_\_\_\_\_ with grade  $\geq 2.7$
- Capstone Course: ENV G/GH/ATMS/OCN 600 with grade  $\geq 2.7$ 
  - $\geq 150$  hours of activity with partner organization
  - Final report
  - Capstone product(s): \_\_\_\_\_
  - Narrative evaluation from organizational partner
  - Narrative evaluation from graduate certificate faculty
- Exit survey on certificate program experience

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Signature of Student Upon Completion

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Date

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Conferring Signature of Certificate Faculty

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Date