

Colorado School of Public Health

PhD in Epidemiology

(for students matriculating Summer 2018 or later)

Description of the Program:

The PhD program in Epidemiology trains highly skilled individuals in epidemiologic research and its application to population health science to prepare graduates for research and teaching careers. The curriculum includes training in advanced epidemiologic methods for clinical, observational and community-based research including study design, statistical analysis, biological principles and disease etiology to meet the rigors of the scientific community. The program's etiologic orientation is based on the premise that knowledge of genetic, behavioral, environmental, and physiologic factors contribute to understanding the underlying causes of complex human diseases needed to develop effective preventive measures.

Pre-requisites:

- Two semesters of calculus (differential and integral) each with a grade of B or better
- A previous upper level statistics or biostatistics course with a grade of B or better
- Previous coursework or experience with some statistical software, e.g. SAS, R, etc.
- Prior coursework in upper division (3000/4000 level) undergraduate coursework in science
- Master's degree

Foundational Public Health Knowledge Requirement:

It is a requirement of the school's accreditation that PhD students are grounded in foundational public health knowledge. To satisfy this requirement, all PhD students must complete the following courses:

- Foundations in Public Health (PUBH6600- 2 credits)
- Public Health Concepts for Non-MPH (EHOH 6601- 1 credit)
- Epidemiology (EPID 6630- 3 credits)

Students with a prior MPH degree or a graduate-level degree from a CEPH-accredited institution may be eligible to waive this requirement. These students must submit a requirement waiver request form to the Office of Academic affairs, documenting the student's eligibility to waive this requirement.

Contact Information:

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Competencies

PhD-EPID 1: Formulate sound scientific research questions and transform them into a research protocol and analysis plan.
PhD-EPID 2: Critically review the scientific literature in order to appraise the methodologic quality of individual studies, synthesize a body of evidence and identify areas of need for future investigation.
PhD-EPID 3: Select and apply appropriate study design, data collection and analysis methods to address research or public health topics.
PhD-EPID 4: Utilize a variety of data sources to address a given research or public health question; considering limitations, study design and analytic solutions.
PhD-EPID 5: Interpret measures of disease burden associated with an exposure to determine the most impactful clinical or public health interventions.
PhD-EPID 6: Critically appraise research and public health studies for internal and external validity, with consideration of how these issues influence interpretation of study findings.
PhD-EPID 7: Anticipate types of biases that may occur in research and public health studies and determine strategies to prevent or minimize these.
PhD-EPID 8: Calculate and interpret measures of disease frequency and association measures to draw appropriate inferences and evaluate causality.
PhD-EPID 9: Develop statistical models appropriate to specific study designs, distinguishing between predictive, associative, and causality-based analytic approaches.
PhD-EPID 10: Carry out appropriate power or precision calculations to ensure that sample size is sufficient to achieve the scientific aims or address a specific research hypothesis.
PhD-EPID 11: Understand and apply nuanced ethical and legal principles involved in the collection, management, use and dissemination of epidemiologic data.
PhD-EPID 12: Communicate both verbally and in writing to make persuasive arguments for non-statistical scientists, practitioners and community members.
PhD-EPID 13: Demonstrate expertise to lead a multidisciplinary research team or collaboration.

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The following table lists the credit hours required to complete the PhD program. If the above described pre-requisites are not met, they will need to be completed in addition to the required coursework for the PhD.

Course Requirements	Credit Hours
Core Epidemiology Coursework	6 total
EPID 6631 (Analytical Epidemiology)	3
EPID 7632 (Advanced Epidemiology)	3
Core Biostatistics Coursework	6 total
BIOS 6611 (Biostatistical Methods I)	3
BIOS 6612 (Biostatistical Methods II)	3
Research Methods Coursework	13 total
EPID 7605 (Research Methods with Secondary Datasets)	3
EPID 7911 (Field Methods)	3
EPID 7912 (Research Grant)	3
Analytic Methods in Epidemiology*	4
Additional Coursework	13 total
CLSC 7151 (Research Ethics)	1
Biomedical Sciences**	6
Electives	6
Dissertation	30 total
EPID 8990	30
Total Semester Credit Hours	68

*A minimum of 4 credits of advanced analytic coursework in biostatistics or epidemiologic methods from the ColoradoSPH

**A minimum of 6 credits of basic science coursework at the graduate level related to the student's thesis topic.

PhD Example Sequence

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Year 1	
Fall	BIOS 6611 (Biostatistical Methods I) (3) EPID 7631 (Advanced Analytical Epidemiology) (3) Elective
Spring	BIOS 6612 (Biostatistical Methods II) (3) EPID 7605 (Research Methods in with Secondary Data Sets) (3) EPID 7632 (Advanced Epidemiology) (3)
	Preliminary Examination
Year 2	
Fall	EPID 7911 (Epidemiologic Field Methods) Analytic Methods in Epidemiology Elective
Spring	CLSC 7150 (Ethics and Responsible Conduct of Research) (1) EPID 7912 (Research Grant) (3) Analytic Methods in Epidemiology
	Teaching Assistant Requirement
Year 3	
Fall	EPID 7911 (Epidemiologic Field Methods) Biomedical Minor
Spring	Biomedical Minor EPID 8990 (Dissertation Credits)
	Comprehensive Examination
Year 4	
Fall	EPID 8990 (Dissertation Credits)
Spring	EPID 8990 (Dissertation Credits)
Year 5	
Fall	EPID 8990 (Dissertation Credits)
Spring	EPID 8990 (Dissertation Credits)
	Final Defense