Colorado School of Public Health

PhD in Epidemiology Advising Guide

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 contributes to understanding the underlying causes of complex human diseases needed to develop effective preventive measures.

Pre-requisites:

- One semester of calculus with a grade of B or higher
- A previous biostatistics course with a grade of B or higher
- Previous coursework or experience with some statistical software, e.g. SAS, R, etc
- Prior coursework in biological sciences
- All prerequisite coursework must be completed at or above the undergraduate level
- Master's degree or the equivalent work experience

Foundational Public Health Knowledge Requirement:

It is a requirement of the school's accreditation that all ColoradoSPH MS and PhD students are grounded in foundational public health knowledge. This is a curriculum requirement of the MS program, and a prerequisite to the PhD program. To satisfy this requirement, all MS and 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. The form is available at:
http://www.ucdenver.edu/academics/colleges/PublicHealth/resourcesfor/currentstudents/academics/Pages/Forms.aspx

Contact Information:

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Table 1. PhD Epidemiology Competencies

Competency	How Covered
1. Transform scientific questions into study aims with testable hypotheses, a research protocol with appropriate data collection methods and an analysis plan.	This competency is addressed through didactic course work (EPID 7632, EPID 7605, EPID 7912) completed in the first 3 years of study and the written dissertation proposal developed for the Comprehensive Exam completed by the end of the third year of the program. PhD students develop study aims with testable hypotheses, a research methods section, and a data analysis plan in EPID 7632 (Advanced Epidemiology Methods 2) and EPID 7605 (Research Methods with Secondary Datasets). In EPID 7912 (Developing a Research Grant), students develop a complete written grant proposal for their dissertation complete with specific aims, hypotheses, significance, innovation, methods section (including study design and analysis), and budget. This class is generally completed in the Fall semester of their third year of study to prepare students for the Comprehensive Exam.
2. Synthesize a body of evidence, while critically evaluating methodologic quality of individual studies, to identify areas of need for future investigation.	This competency is addressed through EPID 7632 (Advance Epidemiology Methods 2) and EPID 7912 (Developing a Research Grant). In EPID 7632, students develop an analytic proposal with a research background section which synthesizes a body of literature and identifies the need for future investigation addressed by their proposed analysis. In EPID 7912 students conduct a comprehensive literature review and evidence synthesis on the topic selected for their dissertation research. They develop a significance section based on synthesis of literature related to their area of interest. Both courses require students to identify the gaps in knowledge and recommend areas for future investigation.
3. Create research proposals to answer a research or public health question using a variety of data sources; considering limitations, study design and analytic solutions.	This competency is addressed through didactic course work (EPID 7632, EPID 7605, EPID 7912) completed in the first three years of study. It is further addressed via mentoring to develop the written dissertation proposal for the Comprehensive Exam completed by the end of the third year of the program. Research proposals developed in EPID 7632 and EPID 7605 are more focused on specifying the study question, defining study populations in a variety of data sources, and the development of methodology sections for proposals (that include specification of study design, analytic methods, and limitations. PhD students further refine this competency through EPID 7912 (Developing a Research Grant), completed in the third year. In this class each student is supported in writing their dissertation research proposal that includes specific aims, hypotheses, significance, innovation, methods section (including study design and analysis) and budget. Finally, students are provided mentoring and support by their dissertation committee to develop a comprehensive research proposal for their comprehensive exam. The proposal expands upon the research proposal developed in EPID 7912.

4. Develop statistical models appropriate to specific study designs, distinguishing between predictive, associative, and causality-based analytic approaches.	This competency is addressed through didactic course work (EPID 7632) completed in the first 3 years of study. Students are individually graded on their ability to articulate the appropriate type of model, including how to operationalize the exposure and outcome variables; and develop an analytical plan for prediction vs. understanding etiology for a given study design (i.e., case-control, prospective cohort, retrospective cohort).
5. Demonstrate mastery of a substantive area of research including knowledge and application of that knowledge in conducting original research	This competency is addressed through EPID 7912 (Developing a Research Grant). Students are individually graded on their ability to demonstrate mastery of an area of research that will be addressed by their dissertation (via a comprehensive literature review transformed into the background section for the research project), creation of a research and analytic plan to answer specific aims and assemble a multidisciplinary research team dissertation proposal.

Table 2. PhD Epidemiology Required Coursework

Course Requirements	Credit Hours
Core Epidemiology Coursework	6 total
EPID 7631 (Advanced Epidemiology 1)	3
EPID 7632 (Advanced Epidemiology 2)	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 (Developing a Research Grant)	3
Analytic Methods in Epidemiology*	4
Additional Coursework	13 total
CLSC 7150 or CLSC 7151 (Ethics in Research)	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 biological/basic science coursework at the graduate level related to the student's thesis topic.

Table 3. PhD Example Sequence 5-Year

Year 1	
Fall	BIOS 6611 (Biostatistical Methods I) (3) EPID 7631 (Advanced Epidemiology 1) (3) Elective
Spring	BIOS 6612 (Biostatistical Methods II) (3) EPID 7605 (Research Methods in with Secondary Data Sets) (3) EPID 7632 (Advanced Epidemiology 2) (3)
June	Preliminary Examination
Year 2	
Fall	EPID 7911 (Epidemiologic Field Methods) Analytic Methods in Epidemiology Elective
Spring	CLSC 7150 or CLSC 7151 (Ethics and Responsible Conduct of Research) (1) Analytic Methods in Epidemiology EPID 7911 (Epidemiologic Field Methods)
Anytime	Teaching Assistant Requirement - 1
Year 3	
Fall	EPID 7912 (Research Grant) (3) Biomedical Minor
Spring	EPID 8990 (Dissertation Credits) Biomedical Minor
Spring/Summer of Year 3	Comprehensive Examination
Year 4	
Fall	EPID 8990 (Dissertation Credits)
Spring	EPID 8990 (Dissertation Credits)
Anytime	Teaching Assistant Requirement - 2
Year 5	
Fall	EPID 8990 (Dissertation Credits)
Spring	EPID 8990 (Dissertation Credits)
Anytime	Final Defense

Table 4. PhD Example Sequence 4-Year*

Year 1	
Fall	BIOS 6611 (Biostatistical Methods I) (3) EPID 7631 (Advanced Epidemiology 1) (3) Elective
Spring	BIOS 6612 (Biostatistical Methods II) (3) EPID 7605 (Research Methods in with Secondary Data Sets) (3) EPID 7632 (Advanced Epidemiology 2) (3)
Summer	EPID 7911 (Epidemiologic Field Methods)
June	Preliminary Examination
Year 2	
Fall	Biomedical Minor Analytic Methods in Epidemiology Elective
Spring	CLSC 7150 or CLSC 7151 (Ethics and Responsible Conduct of Research) (1) Analytic Methods in Epidemiology
Anytime	Teaching Assistant Requirement - 1
Year 3	
Fall	EPID 7912 (Research Grant) (3) EPID 8990 (Dissertation Credits)
Spring	EPID 8990 (Dissertation Credits) Biomedical Minor EPID 8990 (Dissertation Credits)
Early Spring Year 3	Comprehensive Examination
Year 4	
Fall	EPID 8990 (Dissertation Credits)
Spring	EPID 8990 (Dissertation Credits)
Anytime	Teaching Assistant Requirement - 2
Anytime	Final Defense

**To complete in 4 years, the most influential curricular choice is whether to take EPID 7912 (Developing a Research Grant) in Fall of Year 2 or Year 3. Preparation for EPID 7912 typically occurs during the summer prior to the course and requires (at the start of the summer) an advisor/mentor to be identified, a general sense of thesis topic, and some familiarity with the background literature. Taking it in Year 2 results in a very busy Spring (preparing for Preliminary Exam, brainstorming thesis topics and mentor) and Summer in Year 1 (Preliminary Exam, preparing for EPID7912). Taking it in Year 3 results in a tight timeline to complete your thesis (~1 year).*

Program Requirements Checklist, Part 1 (student to complete yellow highlighted boxes)

Course Requirements	Required Credits	Term and Year Taken	Credits Taken	Transfer or Prior Degree?
Core Epidemiology Coursework	**6**			
EPID 7631 (Advanced Epidemiology 1)	3			
EPID 7632 (Advanced Epidemiology 2)	3			
Core Biostatistics Coursework	**6**			
BIOS 6611 (Biostatistical Methods I)	3			
BIOS 6612 (Biostatistical Methods II)	3			
Research Methods Coursework	**13**			
EPID 7605 (Research Methods with Secondary Datasets)	3			
EPID 7911 (Field Methods)	3			
Add brief project description				
Add brief project description				
Add brief project description				
EPID 7912 (Developing a Research Grant)	3			
Analytic Methods in Epidemiology*	4			
Add Course Number and Name				
Add Course Number and Name				
Additional Coursework	**13**			
CLSC 7150 or CLSC 7151 (Ethics in Research)	1			
Biomedical Sciences**	6			
Add Course Number and Name				
Add Course Number and Name				
Add Course Number and Name				
Electives	6			
Add Course Number and Name				
Add Course Number and Name				
Add Course Number and Name				
Dissertation	**30**			
EPID 8990	30			
Add Rows for Each Semester Taken				
Add Rows for Each Semester Taken				
Add Rows for Each Semester Taken				
Add Rows for Each Semester Taken				
Add Rows for Each Semester Taken				
Total Semester Credit Hours	**68**			

Program Requirements Checklist, Part 2 (student to complete highlighted boxes)

Other Program Requirements		
TA Core Epidemiology Course		
Course 1	Add course number and name	Term TA'ed
Course 2 or NA (if matriculated 2022 and earlier)	Add course number and name	Term TA'ed
EDG		
Regular Attendance - those not meeting requirement will be notified by email annually		
Presentation		
Year 2	Add date presented	
Year 3	Add date presented	
Year 4	Add date presented	
Year 5 or NA	Add date presented	
Year 6 or NA	Add date presented	