

# PUBLIC HEALTH SCIENCES: SPECIALIZATION IN EPIDEMIOLOGY (PHD)

## Doctor of Philosophy in Public Health Sciences, specialization in Epidemiology

Unit: School of Public Health and Information Sciences (<http://louisville.edu/sphis/>) (GH)

Department: Epidemiology and Population Health (<http://louisville.edu/sphis/departments/epidemiology-population-health/>)

Program Website (<http://louisville.edu/sphis/departments/eph/academics/>)

Academic Plan Code(s): PHSCPHDEPI

## Program Information

The specialization in Epidemiology in the PhD program in Public Health Sciences is designed to develop academic researchers in population-based epidemiology.

### Competencies

To graduate, students in the PhD specialization in Epidemiology must be able to demonstrate the following competencies:

- Explain the evolving paradigms of epidemiological theory and study design and their impact on public health services
- Critically evaluate scientific literature on an epidemiologic problem to identify strengths and limitations, biases and gaps in knowledge
- Formulate epidemiologic research questions and testable hypotheses
- Apply epidemiologic study designs for specific research hypotheses
- Apply computer software for data management and analysis
- Design and apply methods for data collection and management for epidemiologic research
- Apply advanced quantitative methods to analyze an epidemiologic problem
- Integrate cross-disciplinary knowledge from molecular to population levels to make appropriate causal inferences
- Communicate in written and oral presentations epidemiologic concepts and findings to diverse audiences
- Demonstrate mastery of a substantive area of epidemiology
- Complete a hypothesis-based epidemiologic research study suitable for publication in a peer-reviewed journal

In greater detail, a PhD student must specifically demonstrate:

- In-depth knowledge of the history and philosophy of epidemiology
- Mastery of experimental and observational study designs and the ability to identify optimal designs for specific hypotheses
- Ability to develop and apply:
  - Questionnaires
  - Biomarkers for health status, exposure, and susceptibility
- Mastery of multivariable analytic methods for evaluating risk and prognosis
- Ability to critically evaluate the published epidemiologic research
- Expertise in one or more epidemiologic specialties such as nutritional, molecular, clinical, genetic, cancer, or chronic disease epidemiology
- Practical knowledge of issues in research management including:

- Formation and leadership of multidisciplinary teams
- Staffing, budgeting, tracking
- Subject recruitment and retention
- Data quality control and data safety management
- Funding mechanisms and grantsmanship
- Research ethics and regulations
- Professional quality peer-review, oral and poster presentation, report, grant, and manuscript writing
- Mentoring of junior peers
- Development, conduct, completion and defense of a dissertation on an original research project

Competencies are demonstrated by passage of the proficiency and candidacy examinations, by successful mentoring of master's students or doctoral students not yet in candidacy, and by successful completion and defense of the dissertation.

### Faculty Advisor

Upon admission to the specialization, each student is assigned a faculty advisor who works with the student to develop a program of study.

## Admission Requirements

Students who have satisfactorily completed the MS degree in Epidemiology are eligible for the PhD specialization in Epidemiology.

Students who have satisfactorily completed a master's degree in a relevant discipline (for example MPH, MBBS) or other advanced degree (for example, MD or DO) may be accepted into the PhD in Public Health Sciences, specialization in Epidemiology pending evaluation of appropriate training, experience, and coursework. Previous coursework in mathematics and/or statistics and biological or health sciences (for example, biology, biochemistry, anatomy, physiology, microbiology) is strongly recommended.

The following are required for admission to the University of Louisville and should be submitted to the Graduate School:

- Formal graduate application (<https://louisville.edu/graduate/futurestudents/apply-materials/application/>)
- Official transcripts
- Curriculum vitae
- A one-page personal statement describing the applicant's background and interest in epidemiology
- Two letters of recommendation
- Undergraduate GPA at least 3.0 on 4.0 scale
- International students for whom English is not their primary language must show English language proficiency by one of the following:
  - Test of English as a Foreign Language (TOEFL) score 79 or higher on the internet-based test, 213 or higher on the computer-based test.
  - Official IELTS score of at least 6.5 overall band score from the academic module exam.
  - Official Duolingo overall score of 105.
- Hold a bachelor's or advanced degree from an accredited institution in the United States.
- ECFMG (Educational Commission for Foreign Medical Graduates) certification

## Application Deadline

Fall semester - January 1 (International applicants); February 1 (Domestic applicants).

To be competitive for available program scholarship opportunities, applicants should apply on or before March 1 for full consideration.

Spring semester - Applications are not accepted.

Summer semester – Applications are not accepted.

## Program Requirements

The Public Health PhD specialization in Epidemiology is designed to consist of 49 credit hours of coursework over a minimum of two years plus one to four years for completion of the dissertation. The coursework is organized into two blocks of 26 and 23 credit hours. The curriculum outlined below represents an *ideal* sequence for a full-time student. A part-time student may need to deviate from this sequence. Completion of the first block of coursework is prerequisite for sitting for the proficiency examination. After passing the proficiency examination, the student can proceed with the second block of coursework. Successful completion of the second block is prerequisite to sitting for the candidacy examination.

After passing the candidacy examination, the student is admitted to doctoral candidacy. A doctoral candidate must then successfully develop and defend a dissertation proposal that describes an original and independent research project. Upon successful defense of the proposal, the student may then proceed to dissertation research. Upon successful completion of the research, oral defense of the dissertation, and demonstration of the required competencies listed above, the student is awarded the PhD degree.

## Coursework

49 total credit hours (beyond admission requirements) consisting of the following:

- 20 credit hours of required courses
- 8 credit hours of seminars in Epidemiology
- 21 credit hours of elective/selective/independent study courses

**Note:** Students who have completed the MS degree and have been accepted to the PhD program will advance to Block 2/Year 2 of the PhD curriculum upon matriculation. These students will still be required to complete the Seminar and Content Course Electives credits listed in Block 1/Year 1.

Course	Title	Hours
<b>Year 1</b>		
<b>Fall</b>		
PHEP 621	Statistical Foundations for Epidemiology	4
PHEP 622	Population Pathology	3
PHEP 623	Theoretical Foundations of Epidemiology	3
PHEP 750	Seminars in Epidemiology	2
<b>Hours</b>		<b>12</b>
<b>Spring</b>		
PHEP 618	Epidemiologic Methods II	4
PHEP 750	Seminars in Epidemiology	2
Content Course Electives or Public Health Selectives (see lists below)		6
<b>Hours</b>		<b>12</b>

<b>Summer</b>		
PHEP 778	Doctoral Independent Study in Epidemiology and Population Health (optional, 3-6 credit hours)	optional
<b>Hours</b>		<b>0</b>
<b>Year 2</b>		
<b>Fall</b>		
PHEP 701	Advanced Epidemiologic Methods	3
PHEP 702	Epidemiologic Research Management	3
PHEP 750	Seminars in Epidemiology	2
Content Course Elective or Biostatistics Selective (see lists below)		3
<b>Hours</b>		<b>11</b>
<b>Spring</b>		
Content Course Elective		3
Content Course Elective or Biostatistics Selective (see lists below)		3-6
PHEP 750	Seminars in Epidemiology	2
PHEP 778	Doctoral Independent Study in Epidemiology and Population Health	3-6
<b>Hours</b>		<b>14</b>
<b>Minimum Total Hours</b>		<b>49</b>

## Elective and Selective Coursework

**Content Course Electives** consist of courses specialized in either an exposure or disease category and offerings will vary from semester to semester based upon faculty workloads and student programs of study. These may include:

- PHEP 607 Epidemiology of Cancer
- PHEP 611 Nutritional Epidemiology
- PHEP 613 Epidemiology of Aging and Disability
- PHEP 615 Foundations of Global Maternal and Child Health
- PHEP 620 Environmental and Occupational Epidemiology
- PHEP 624 Methods in Reproductive and Perinatal Epidemiology
- PHEP 625 Child Health & Development
- PHEP 626 Introduction to Social Epidemiology

**Public Health Electives** may be an offering from another SPHIS department.

**Biostatistics Electives** should be restricted to advanced courses such as PHST 684 Categorical Data Analysis, PHST 683 Survival Analysis, or PHST 750 Statistics for Bioinformatics. These electives are subject to instructor permission. Students must discuss their choices with their advisor and rationalize them with respect to their program of study which must be approved by the Program Director.

A minimum of 26 credit hours of coursework is required before taking the Proficiency Exam.

A minimum of 50 credit hours of coursework is required before taking the Candidacy Exam.

## Proficiency Examination

Upon successful completion of the first block of required coursework, the student is eligible to sit for the written proficiency examination, which is administered by a committee of departmental faculty appointed by the chair. The timing of the proficiency examination is determined by the student's faculty advisor and the department chair. The subject matter includes basic knowledge of disease biology and pathophysiology; theory and skills in epidemiologic research methods, including study design and management; and quantitative analytic methods. A student who does not successfully pass the proficiency examination is allowed a second

opportunity to pass the exam. Failing the proficiency examination the second time results in dismissal from the program.

## Candidacy Examination

After passing the proficiency examination and upon completion of the second block of coursework, the student is eligible to sit for the written and oral candidacy examination, which is administered by a committee appointed by the department chair and composed of graduate faculty. The subject matter includes knowledge of advanced epidemiologic methods; specialized knowledge pertaining to the minor field of specialization; disease biology and pathophysiology, which may be tailored to the student's special area of interest; and knowledge of the research process. Successful passage of the candidacy examination admits the student to doctoral candidacy. A student who does not successfully pass the candidacy examination may be required to take additional or remedial coursework and is allowed a second opportunity to pass the exam. Failing the candidacy examination the second time results in dismissal from the program.

## Dissertation

A dissertation is required of every candidate for the degree of Doctor of Philosophy in Public Health Sciences, specialization in Epidemiology. The dissertation is a scholarly achievement in research and presents an original contribution to knowledge. It should demonstrate a thorough understanding of research techniques in epidemiology and the ability to conduct independent research. The following sections summarize the basic requirements for the dissertation committee, dissertation proposal, and defense. Additional details are available in the department's document "Student Advising, Thesis and Dissertation Committees."

### Dissertation Committee

The dissertation is read by a dissertation committee, chaired by the student's faculty advisor and appointed by the Dean of the school on the recommendation of the program director and chair of the department. The committee consists of at least four members and must include one representative of an allied department. The dissertation must be approved by the committee and the chair of the department.

### Dissertation Proposal

After successful completion of the qualifying examination, a doctoral candidate must submit a written dissertation proposal to the members of the dissertation committee. The candidate is then orally examined on the dissertation proposal.

### Dissertation Preparation

The dissertation is prepared with the formatting according to the guidelines of the Graduate School (<http://louisville.edu/graduate/current-students/thesis-dissertation-information/>).

### Dissertation Approval

The dissertation is submitted in completed form to the chair of the department at least thirty days before the end of the term in which the candidate expects to be graduated, and the candidate is not eligible for final examination until the dissertation has been received by the committee and chair.

The dissertation committee schedules an oral defense by the candidate. The time and place for the defense is published to the general academic community, members of which are free to attend the defense. The dissertation is approved by a majority vote of the committee and the concurrence of the department chair.

### Dissertation Submission

The following steps must be taken to submit the final copy of the dissertation electronically after oral defense and approval of the committee:

1. Final document must be converted to a PDF (following the guidelines as noted above) and sent to the Graduate School and the department's administrative assistant.
2. Submit as advised by the Graduate School through the ThinkIR repository. The directions on submission will be provided upon review of the dissertation by the Graduate School.
3. The signature page within the electronic version must have the names of your committee members typed under the signature line; the signatures cannot be scanned into the document.
4. Submit a signed signature page, digital/electronic signature page (<http://louisville.edu/graduate/current-students/thesis-dissertation-information/>) can be found on the Graduate School web-site.

A copy of the final, signed dissertation must also be deposited with the department office.