
Master of Science in Epidemiology

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Website: <http://louisville.edu/sphis/deph/academics.html>

Introduction

The M.S. program in Epidemiology is designed to prepare students for the Ph.D. program in Public Health Sciences with a concentration in epidemiology. The M.S. in epidemiology is offered by the Department of Epidemiology and Population Health.

Competencies

To graduate, students in the M.S. program in epidemiology must maintain a GPA of 3.0 or higher and demonstrate the following competencies:

- Explain the evolving paradigms of epidemiologic theory and study design and their impact on public health and medical sciences
- Summarize scientific literature on an epidemiologic problem
- Formulate epidemiologic research questions and testable 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

In greater detail, an MS student must specifically demonstrate:

- Mastery of the principles of epidemiologic, observational study design, including:
 - The merits and limitations of cross-sectional, retrospective and prospective designs
 - Methods of disease surveillance and case ascertainment
 - Methods of population-based sampling
 - Sample size and statistical power calculation
 - Issues in the measurement of exposure and disease transmission
 - Identification and correct interpretation of potential biases in study design
- Knowledge of the socioeconomic and geographic distribution, risk factors, and etiology of major acute, infectious and chronic morbidity and mortality.
- Mastery of basic methods of analysis of epidemiologic data, including:

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- Measures of disease frequency, prevalence and incidence
- Methods for adjusting rates for age, gender, etc.
- Measures of association, odds ratio, relative risk
- Control of confounding and effect modification through stratification and statistical control
- Modeling in multiple logistic regression
- Principles of survival analysis
- Correct interpretation of results with regard to issues of error, bias and criteria for causality

These competencies are demonstrated through the successful completion of the coursework and the design, execution, documentation, and presentation of the research for the student's thesis.

Admission

Students with a prior baccalaureate or more advanced degree in an appropriate field of study, from a regionally accredited university or college are eligible for the M.S. program in epidemiology. Previous coursework in mathematics and/or statistics and biological or health sciences (for example, biology, biochemistry, anatomy, physiology, and/or microbiology) is strongly recommended. Applicants who are judged to not have sufficient prior coursework or experience in these areas may be required to take additional coursework.

The following are additionally required for admission:

- Formal application through SOPHAS with transcripts and 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
- Official GRE scores taken within the past five years. Score greater than the 50th percentile on each of the quantitative and verbal sections is recommended.
- If applicable, Test of English as a Foreign Language (TOEFL) score in at least 60th percentile

Curriculum

The program is designed as a two-year program of coursework and thesis research and preparation. The student is expected to develop and plan his or her thesis research prior to the final semester in which the majority of the actual research is done.

Faculty Advisor

Upon admission to the M.S. program, each student is assigned a faculty advisor by the department chair or program director. Students and/or advisors who wish to change their assigned relationship must make a written request to the department chair or program director.

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Program of Study

The student and his or her faculty advisor work together to develop a program of study that recognizes the student's research interests and core elements of modern epidemiology and its breadth and multidisciplinary nature.

Degree Requirements

Degree requirements include required coursework in epidemiology, elective coursework in biostatistics and in public health sciences, and a thesis.

Coursework

38 total credit-hours:

20 credit hours of required coursework

12 credit hours of elective coursework

6 credit hours of thesis research

Required Coursework			
Semester	Course #	Course Title	Credit Hours
Fall I	PHEP-621	Statistical Foundations for Epidemiology	3
	PHEP-622	Population Pathology	3
	PHEP-623	Theoretical Foundations of Epidemiology	3
	PHEP-648	Data Management and Analysis for Epidemiology I	1
	Semester Total		
Spring I	PHEP-xxx	<i>Content Course Elective*</i>	3
	PHxx-xxx	<i>Public Health Selective**</i>	3
	PHEP-618	Epidemiologic Methods II	3
	PHEP-649	Data Management and Analysis for Epidemiology II	1
	Semester Total		
Summer	PHEP-666	Masters Independent Study *** (optional)	(3)
Fall II	PHEP-701	Advanced Epidemiologic Methods	3
	PHEP-702	Epidemiologic Research Management	3
	PHEP-xxx	<i>Content Course Elective*</i>	3
	Semester Total		
Spring II	PHEP-xxx	<i>Content Course Elective*</i>	3
	PHEP-666	Master's Independent Study in Epidemiology and Population Health***	3 (or 6)
	Semester Total		
MS Candidacy (Thesis Completion)			
Degree Total			38

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* PHEP-xxx *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. In the MS program these courses will emphasize (*if not be restricted to*):

- PHEP 607 Epidemiology of Cancer
- PHEP 611 Nutritional Epidemiology
- PHEP 613 Epidemiology of Aging
- PHEP 615 Maternal Child Health
- PHEP 620 Environmental Epidemiology
- PHEP 624 Reproductive Epidemiology
- PHEP 625 Child Health & Development
- PHEP 626 Social Epidemiology

** PHxx *Public Health Selective* may be a PHEP offering or an offering from another SPHIS department: students will have to rationalize their selection with respect to their program of study which must be approved by the Program Director.

*** PHEP 666 Masters Independent Study in Epidemiology is an independent study course in which an MS student can *research and develop a thesis idea*. A total of 6 credits of enrollment in PHEP-666 is required. Students may elect to take 3 credits in the summer and 3 in the Spring II semester, or take all 6 credits in Spring II. Completing the course does not mean they have completed their thesis. Thesis completion follows the requirements laid out in the Student Handbook and is not achieved by a for-credit-course.

Thesis

The Thesis is expected to be a scholarly achievement in research that demonstrates a thorough understanding of research techniques in epidemiology. It is expected to be original, professional quality, and worthy of publication, in whole or in part, in the peer-reviewed scientific literature.

Thesis Committee

A thesis committee consists of three faculty members. The committee chair must be an active, full-time faculty member in the Department of Epidemiology & Population Health. At least one member must be from another department in SPHIS, another school or unit in the university, or outside of the university pending approval of graduate faculty status. In all cases, the majority of a committee must hold primary appointments in the department.

Thesis Proposal

Students are required to submit a written proposal and make a formal oral presentation to their committee before embarking on thesis research. The proposal should include a brief, but comprehensive literature review supporting an acceptable research rationale, hypotheses and specific aims, a proposed study design, a preliminary outline of methods, a list of resources, and a tentative timetable. The committee will discuss with the student any revisions needed before the student can progress with their research.

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Thesis Preparation

The thesis is to be prepared in format and binding according to the guidelines established by the School of Interdisciplinary and Graduate Studies, available at <http://louisville.edu/graduate/current-students/thesis-dissertation-information>.

Thesis Approval

The written thesis must be submitted in completed form to all members of the committee at least thirty days before the end of the term in which the candidate expects to graduate

The student must schedule their oral defense at least two weeks in advance so that the time and place for the oral presentation may be posted to the faculty and students of SPHIS and general academic community who are free to attend. The student should also pay close attention to university deadlines for submitting their work to the School of Interdisciplinary & Graduate Studies and in relation to graduation.

The thesis is approved by a majority vote of the committee.

Thesis Submission

The following steps must be taken to submit the final copy of the thesis 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 SIGS and the department's administrative assistant.
2. Submit as advised by the School of Interdisciplinary and Graduate Studies through the ThinkIR repository. [Click here to download instructions on this process](#).
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 on white paper, with original signatures, to the School of Interdisciplinary and Graduate Studies, attention Courtney Kerr.

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

Accreditation

The School of Public Health and Information Sciences accredited by the Council on Education for Public Health (CEPH).

The University of Louisville is accredited by the Southern Association of Colleges and Schools Commission on Colleges (SACSCOC).

For more information, see the [School's accreditation webpage](http://louisville.edu/sphis/accreditation) (<http://louisville.edu/sphis/accreditation>).

Program Data and History

Program Data	
Name	Master of Science in Epidemiology
Degree	M.S.
Department	Department of Epidemiology and Population Health
Unit	School of Public Health and Information Sciences
Version	2010.06.03-06

Program History				
Version	Submitted	Approved	Change Summary	Author
2006.09.06	09/10/06	10/24/06	Initial program and curriculum	
2006.09.06-01	07/23/07	07/23/07	<ul style="list-style-type: none"> Changed prefix PHPB to PHPB Reformatted and reorganized to match template reformatted and reorganized to match template 	
2006.09.06-02	08/02/07	08/02/07	Clarified competencies, admission, and faculty advisor	
2006.09.06-03	07/29/09	07/29/09	<ul style="list-style-type: none"> Editorial changes to meet university style guide Administrative changes replacing Grad School with SIGS 	
2010.06.03	07/22/10	07/29/10	<ul style="list-style-type: none"> Increased required credit hours to 38 from 36 Added PHEP-648 and -649 (each 1 credit hour lab) Replaced PHEP-602 with PHEP-618 in Fall I Replaced PHEP-618 with PHEP-701 in Spring I Added PHEP-702 in Spring I Removed groupings of electives 	
2010.06.03-01	08/29/10	08/29/10	<ul style="list-style-type: none"> Revised section on elective by opening up to all PHxx courses. Corrected distribution of credit hours. 	
2010.06.03-02	06/04/13	07/08/15	<ul style="list-style-type: none"> Updated administrative assistant 	Ms. Tammi Thomas
	08/04/14		<ul style="list-style-type: none"> Replaced PHEP-619 with PHEP-622 	Jack Barnette
	07/08/15		<ul style="list-style-type: none"> Added accreditation section 	Dr. Peter L. Walton
2010.06.03-03	02/10/16	02/26/16	<ul style="list-style-type: none"> Updated Thesis Distribution information and link to SIGS dissertation guidelines. 	C. Winton Reynolds
2010.06.03-04	05/23/17	06/26/17	<ul style="list-style-type: none"> Changed course name for PHEP-666 	C. Winton Reynolds
2010.06.03-05	9/12/18	11/5/18	<ul style="list-style-type: none"> Replaced 3 credits of electives and 3 credits of PHEP-666 Masters Independent Study with two required courses: PHEP-621 and PHEP-623. Credit hour total for the degree unchanged. Outlined list of approved PHEP elective courses. Re-sequenced some of the existing courses. Revision of language describing Thesis requirements. Approved by SPHIS 10/19/18 Approved by provosts' office: 11/5/18 	Rick Baumgartner, PhD
2010.06.03-06	6/19/19	6/19/19	<ul style="list-style-type: none"> Addition of CEPH competencies listing for program – no change to original competencies. Addition of admissions requirements that were unintentionally omitted from previous versions. No change in admissions requirements. Approved by SPHIS: 6/19/19 No provost's office approval needed 	Rick Baumgartner, PhD