
Master of Science in Epidemiology

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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:

1. Mastery of the principles of epidemiologic, observational study design, including:
 - a. The merits and limitations of cross-sectional, retrospective and prospective designs
 - b. Methods of disease surveillance and case ascertainment
 - c. Methods of population-based sampling
 - d. Sample size and statistical power calculation
 - e. Issues in the measurement of exposure and disease transmission
 - f. Identification and correct interpretation of potential biases in study design
2. Knowledge of the socioeconomic and geographic distribution, risk factors, and etiology of major acute, infectious and chronic morbidity and mortality.
3. Mastery of basic methods of analysis of epidemiologic data, including:
 - a. Measures of disease frequency, prevalence and incidence
 - b. Methods for adjusting rates for age, gender, etc.
 - c. Measures of association, odds ratio, relative risk
 - d. Control of confounding and effect modification through stratification and statistical control
 - e. Modeling in multiple logistic regression
 - f. Principles of survival analysis
 - g. 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, 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:

- 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.

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
- 6 credit-hours of elective coursework in biostatistics
- 6 credit-hours of elective coursework in public health
- 6 credit-hours of thesis research

<i>Required Coursework</i>			
<i>Semester</i>	<i>Course #</i>	<i>Course Title</i>	<i>Credit-Hours</i>
Fall I	PHEP-618	Epidemiologic Methods II	3
	PHEP-648	Data Management and Processing Lab	1
	PHEP-619	Biology of Disease in Populations	3
	PHxx-xxx	Elective*	3
	Semester Total		10
Spring I	PHEP-702	Research Management I	3
	PHEP-701	Advanced Epidemiologic Methods	3
	PHEP-649	Data Analysis Lab	1
	PHxx-xxx	Elective*	3
	Semester Total		10
Summer	PHEP-666	Thesis Research in Epidemiology (optional)	3
Fall II	PHxx-xxx	Elective*	3
	PHxx-xxx	Elective*	3
	PHEP-666	Thesis Research in Epidemiology	3
	Semester Total		9
Spring II	PHxx-xxx	Elective*	3
	PHEP-666	Thesis Research in Epidemiology	3 to 6
	Semester Total		6 to 9
Degree Total			38

Electives

Program requirements include one elective course in epidemiology and four in a public health area.* Elective courses can be selected from offerings within SPHIS with instructor and program permission. Elective courses in epidemiology (PHEP) and biostatistics (PHST) are strongly encouraged.

Selection of electives for both requirements is done by the student and his or her faculty advisor with approval of the program director or chair of the department.

Students may petition to take courses not on these lists with approval of the instructor, the student's faculty advisor, and the program director or chair of the department or his or her designee.

<i>Pre-Approved Electives</i>		
<i>Course #</i>	<i>Course Title</i>	<i>Credit-Hours</i>
PHST-624	Clinical Trials I	3
PHST-650	Advanced Topics in Biostatistics	3
PHST-680	Biostatistical Methods I	3
PHST-681	Biostatistical Methods II	3
PHST-661	Probability	3
PHST-662	Mathematical Statistics	3
PHST-683	Survival Analysis	3
PHST-684	Categorical Data Analysis	3
PHST-682	Multivariate Analysis	3
PHCI-671	Preventive Medicine I	
PHCI-672	Preventive Medicine II	
PHCI-605	Survey Research Methods	
PHCI-611	Introduction to Clinical Epidemiology	
PHEH-650	Advanced Topics in Environmental and Occupational Health	
PHPB-650	Advanced Topics in Health Promotion and Behavioral Sciences	
PHMS-650	Advanced Topics in Health Management and Systems Sciences	

Thesis

A thesis is required of a candidate for the degree of master of science in epidemiology. It is to be an original work of professional quality and the basis for one or more potentially publishable papers.

Thesis Committee

The thesis is read by a reading committee, chaired by the student's faculty advisor, and appointed by the dean of the school upon the recommendation of the chair of the department. This committee consists of three members and must include one representative of an allied department. The thesis must be approved by the committee and the chair of the department.

Thesis Proposal

The thesis proposal is to be developed in written form and presented to the thesis committee for approval. The thesis topic is to be one or more of the following:

- Critical review of the contemporary epidemiologic literature on a specific disease, risk factor, or health related condition.
- Meta-analysis of results from several epidemiologic studies of a specific disease.
- Research report on analysis of collected data.
- Evaluation of epidemiologic statistical methodology.

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 <https://graduate.louisville.edu/pubs/theses-dissertations>.

Thesis Approval

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

The thesis committee schedules an oral examination of the candidate. The thesis is approved by a majority vote of the committee.

Thesis Distribution

One unbound copy of the thesis, signed by thesis committee, must be deposited with the School of Interdisciplinary and Graduate Studies before graduation.

v2010.06.03

<i>Program Data</i>	
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

<i>Program History</i>			
<i>Version</i>	<i>Submitted</i>	<i>Approved</i>	<i>Change Summary</i>
2006.09.06	09/10/06	10/24/06	<ul style="list-style-type: none"> • Initial program and curriculum
2006.09.06-1	07/23/07	07/23/07	<ul style="list-style-type: none"> • Changed prefix PHPB to PHPB • Reformatted and reorganized to match template
2006.09.06-2	08/02/07	08/02/07	<ul style="list-style-type: none"> • Clarified competencies, admission, and faculty advisor
2006.09.06-3	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	TBD	TBD	<ul style="list-style-type: none"> • Increased required credit hours to 38 from 36 • Added PHEP-648 and -649 (each 1 credit hour lab) • Removed groupings of electives

