
**Doctor of Philosophy in Public Health Sciences
Specialization in Environmental Health**

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Introduction

The specialization in environmental health for the Ph.D. in public health sciences is designed to provide scholars with the tools to conduct in-depth research and provide advanced instruction in the discipline of environmental health at the college and university level. It also prepares researchers for governmental, private, and voluntary organizations involved in environmental protection and the prevention of disease and injury. In addition to understanding advanced concepts of environmental health, industrial hygiene, and toxicology, graduates of this specialization are expected to develop skills that enable them to identify and define questions of environmental and occupational health importance, design research studies to address these questions, and to complete a program of research that demonstrates abilities as an independent investigator.

The Ph.D. specialization in environmental health is in the Department of Environmental and Occupational Health and is part of the Ph.D. program in public health sciences in the School of Public Health and Information Sciences.

Competencies

To graduate, a student in the Ph.D. specialization in environmental health must demonstrate the following competencies:

Competency	Demonstrated by
In depth knowledge of the history of environmental health.	<ul style="list-style-type: none">• Passing qualifying examination• Successful completion and defense of dissertation • Successful development, conduct, completion, and
Mastery of experimental study designs and the ability to identify optimal designs for specific hypotheses.	
Ability to critically evaluate published environmental health research.	
Expertise in one or more environmental health specialty such as risk assessment, environmental management, environmental and occupational toxicology.	

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Competency	Demonstrated by
Practical knowledge of issues in research management including: <ul style="list-style-type: none"> • 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. 	defense of the dissertation
Professional quality peer-review, oral and poster presentation, report, grant, and manuscript writing.	
Mentoring of junior peers.	<ul style="list-style-type: none"> • Successful completion of assignments to work with master’s students on their research, theses, presentations, and posters

Admission

An applicant who has satisfactorily completed an appropriate M.S. degree or MPH with a concentration in environmental health is eligible for admission to the Ph.D. specialization in environmental health. An applicant with an advanced degree (M.D., Ph.D., D.O.) may also be accepted pending evaluation of appropriate training, experience, or coursework. The previous graduate work by such an applicant is reviewed on a case-by-case basis, and the applicant, if admitted, may be required to take additional course work prior to completing the minimum 38 credit hours required for post-master’s doctoral work.

The following are additionally required for admission:

Undergraduate and Graduate GPA > 3.0 on 4.0 scale

Minimum GRE > 500 Verbal; > 600 Quantitative

If applicable, Test of English as a Foreign Language (TOEFL) score > 60th percentile

Curriculum

Faculty Advisor

Upon admission to the Ph.D. specialization, each student is assigned a faculty advisor who works with the student to develop a program of study. The program of study recognizes core elements of environmental health as well as its breadth and multidisciplinary nature. At the Ph.D. level, this requires the selection of courses directly relevant to environmental health, such as biostatistics, epidemiology, molecular genetics, behavioral science, health policy/management, systems sciences, or other relevant areas of study.

Program of Study

Each doctoral student, in consultation with his or her academic advisor and the department chair, plans a program of study that uniquely fits the student’s career goals. The design of a doctoral

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program of study that reflects each student's professional skills and research interest is the primary organizing principle of the proposed program.

Degree Requirements

The emphasis in doctoral training goes beyond accumulating course credit. Completion of the coursework is the prelude to sitting for the qualifying examination. Successful passage of the qualifying examination allows the student to enter 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, a student may then proceed to dissertation research. Upon successful completion of the research, defense of the dissertation, and demonstration of the required competencies listed below, a student is awarded the Ph.D. degree.

The Ph.D. specialization in environmental health is designed as a 38 credit hour program (minimum beyond a master's degree) including the dissertation. Additional hours may be needed for completion of the specialization program.

Coursework

38 total credit hours

26 credit hours of required coursework

3 credit hours of environmental health seminars

9 credit hours of elective courses

Course #	Course Title	Credit Hours
BIOC-645	Advanced Biochemistry I	4
BIOC-647	Advanced Biochemistry II	4
BIOC-668	Molecular Biology	4
PHEH-750	Seminar 1 in Environmental and Occupational Health	1
PHEH-751	Seminar 2 in Environmental and Occupational Health	1
PHEH-752	Seminar 3 in Environmental and Occupational Health	1
PHEP-602	Epidemiological Methods	3
PHEP-620	Environmental and Occupational Epidemiology	3
PHST-620	Introduction to Statistical Computing	3
PHST-680	Biostatistical Methods I	3
PHTX-625	Scientific Writing	2
	Elective courses	9
Degree Total		38

PHEH-750, -751, -752 Seminars in Environmental and Occupational Health

A student in the Ph.D. specialization in environmental health is required to complete the three seminars in environmental and occupational health (PHEH-750, -751, and -752) for a total of 3 credit hours. These group courses are jointly taught by the faculty of the department and are designed to provide a collegial experience that provides an opportunity to integrate learning from

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other courses, discuss hot topics, brain-storm about research ideas, and acquire professional skills in scientific manuscript and grant writing, oral and poster presentations, grantsmanship, and peer review.

Electives

As a part of the approved program of study, nine credit hours of elective coursework is identified. Courses directly relevant to environmental health are preferred, including, but not limited to, biostatistics, bioinformatics, epidemiology, medical geography, molecular or population genetics, toxicology, microbiology, health services research, outcomes research, and health promotion and behavior. Courses may be selected from those offered within the School of Public Health and Information Sciences, other departments within the university, or from sources outside the university with permission and acceptance of credit by the program and dean.

Because the needs vary by research topic for which specific research methods and statistics skills, requirements in these area are difficult to define explicitly for all students. The student's program of study utilizes electives to provide the student with the courses needed in his or her particular case.

A student may petition to take courses not on this list with approval of the instructor and the chair of the department. The student must provide a written rationale for the choices of elective coursework in his or her program of study.

<i>Approved Electives</i>		
<i>Course #</i>	<i>Course Title</i>	<i>Credit Hours</i>
PHEH-753	Independent Study in Environmental and Occupational Health	1-3
PHST-650	Advanced Topics in Biostatistics	3
PHST-680	Biostatistical Methods I	3
PHST-681	Biostatistical Methods II	3
PHPB-650	Advanced Topics in Health Promotion and Behavioral Sciences	3
PHMS-650	Advanced Topics in Health Management and Systems Sciences	3
GEOG-657	Geographic Information Systems	3
GEOG-656	Spatial Statistics	3
PHTX-601	Principles of Medical Pharmacology	3
PHTX-630	Toxicology: Principles and Application	3
PHTX-618	Topics in Pharmacology & Toxicology	3
PHTX-607	Seminar in Genetics and Molecular Medicine	3
BIOC-611	Biochemical and Molecular Methods	3
BIOC-640	Principles of Biochemistry	3
BIOC-670	Protein Structure and Function	3
BIOC-660	Molecular Endocrinology	3
BIOC-641	Advanced Eukaryotic Genetics	3
BIOC-668	Molecular Biology	3
BIOC-675	Cancer Biology	3
BIOL-522	Aquatic Ecology	3
BIOL-563	Population and Community Ecology	3

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<i>Approved Electives</i>		
<i>Course #</i>	<i>Course Title</i>	<i>Credit Hours</i>
BIOL-562	Ecosystem Ecology	3
BIOL-584	Interdisciplinary Frameworks in Environmental Science and Technology	3
BIOL-608	Ecological Instrumentation	3
BIOL-660	Advanced Ecology of Urban and Suburban Landscapes	3
BIOL-657	Advanced Industrial and Food Microbiology	3
CEE-509	Environmental Processes and Systems	3
CEE-534	Industrial Waste Management	3
CEE-535	Solid Waste Management	3
CEE-574	Water and Wastewater Treatment	3
CEE-581	Environmental Impact Analysis	3
CEE-674	Water Resources Systems	3
CEE-675	Surface Water Quality Modeling	3
CHE-509	Environmental Processes and Systems	3
CHE-533	Chemical Engineering Safety and Health	3
CHE-534	Industrial Waste Management	3
CHE-535	Pollution Prevention	3
EXP-600	Physiology of Exercise	3
EXP-605	Human Physiology	3
GEOG-522	GIS and Public Health	3
GEOG-531	GIS and Urban Demographic Analysis	3
GEOG-561	Urban Environmental Quality	3
GEOS-564	Hydrology	3
GEOS-565	Natural Hazards	3
MBIO-601	Molecular Microbiology (Introductory to Infectious Diseases)	3
MBIO-602	Introduction to Immunology	3
MBIO-670	Molecular Virology	3
MBIO-685	Microbial Physiology	3
MBIO-687	Microbial Pathogenesis	3
MBIO-618	Topics in Advanced Microbiology	3
MBIO-680	Genetics of Infectious Diseases	3
MBIO-667	Cell Biology	3
PHZB-605	Systemic Physiology I	3
PHZB-611	Advanced Human Physiology	3
IE-530	Industrial Safety Engineering	3
UPA-678	Land Use and Planning Law	3
UPA-679	Environmental Policy	3
UPA-687	Environmental Policy and Natural Hazards	3

Qualifying Examination

Upon completion of the majority of the required coursework for the Ph.D., the student is eligible to sit for the doctoral qualifying examination. The timing and eligibility for the qualifying examination is determined by the student’s faculty advisor and department chair. Successful completion of the examination admits the student to doctoral candidacy. A student who does not

successfully complete the exam may be required to take additional or remedial coursework and is allowed one opportunity to retake the exam.

Dissertation

A dissertation is required of a candidate for the degree of doctor of philosophy in public health sciences with a specialization in environmental health. It is to be a scholarly achievement in research, and should demonstrate a thorough understanding of research techniques in environmental health and the ability to conduct independent research.

Dissertation Committee

The dissertation shall be read by a reading committee, chaired by the student's faculty advisor, and appointed by the dean upon the advice of the chair of the department. This committee shall consist of 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

A student who successfully completes the qualifying exam must submit a written dissertation proposal to all members of the dissertation committee. The student is then orally examined on the dissertation proposal.

Dissertation Preparation

The dissertation is to be prepared in format and binding according to the guidelines established by the School of Interdisciplinary and Graduate Studies (SIGS), available at <https://graduate.louisville.edu/pubs/theses-dissertations>.

Dissertation Approval

The dissertation is to be 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 accepted by the committee and chair.

The dissertation committee schedules an oral defense by the candidate and notifies SIGS using the form available at <https://graduate.louisville.edu/pubs/theses-dissertations>. The time and place for the defense is published by SIGS 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 Distribution

One unbound copy of the dissertation, signed by the dissertation committee, must be deposited with the SIGS prior to graduation.