To graduate, a student in the Specialization in Environmental Health PhD program must demonstrate the following competencies:

1. Critically evaluate published environmental health research, demonstrated by:
   - Presentation of articles in seminar course
   - Preparation of review article for seminar course
   - Development of NIH-style grant proposal for seminar course
   - Successful completion and defense of dissertation proposal
2. Develop oral and written skills for communicating research results of environmental health research, demonstrated by:
   - Presentation of articles in seminar course
   - Preparation of review article for seminar course
   - Development of NIH-style grant proposal for seminar course
   - Successful completion and defense of dissertation proposal
3. Develop grant-writing skills, demonstrated by:
   - Development of NIH-style grant proposal for seminar course
   - Successful completion and defense of dissertation proposal
4. Perform research on a topic related to environmental health (typically includes most or all of the following: development of a suitable hypothesis; selection of appropriate study design; development of proficiency in data analysis; and presentation of data; discussion of implications for public health based on knowledge gained), demonstrated by:
   - Conduct of dissertation research
   - Successful completion and defense of dissertation

**Faculty Advisor**
Upon admission to the PhD 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 PhD 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 program of study that reflects each student's professional skills and research interest is the primary organizing principle of the proposed program.

The PhD specialization in environmental health is designed as a 39 credit hour program plus the dissertation. Additional hours may be needed for completion of the specialization program.

**Admission Requirements**
An applicant who has satisfactorily completed an appropriate degree with a concentration in environmental health or an advanced degree (MD, DVM, PhD and DO) may be eligible for admission to the PhD in Public Health Environmental Health Specialization 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 coursework prior to completing the minimum 39 credit hours required for post-master's doctoral work.

Students are required to complete an admission application through the Graduate School, Graduate Admissions. The following are additionally required for admission:

- Undergraduate and Graduate GPAs of at least 3.0 on 4.0 scale
- GRE scores from an exam taken within five years of expected matriculation. Although no minimum GRE scores are specified, students who have succeeded in this program have typically had GRE scores above the 50th percentile.
- If applicable, Test of English as a Foreign Language (TOEFL) minimum score of 80 for international applicants

**Program Requirements**
The PhD specialization in Environmental Health is designed as a 39-credit hour program plus dissertation. Additional hours may be needed for completion of the specialization program.

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.
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, a student is awarded the PhD degree.

**Coursework**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOC 645</td>
<td>Advanced Biochemistry I</td>
<td>4</td>
</tr>
<tr>
<td>BIOC 647</td>
<td>Advanced Biochemistry II</td>
<td>4</td>
</tr>
<tr>
<td>BIOC 668</td>
<td>Molecular Biology and Genetics</td>
<td>4</td>
</tr>
<tr>
<td>PHEH 750</td>
<td>Seminar 1 in Environmental Health</td>
<td>4</td>
</tr>
<tr>
<td>&amp; PHEH 751</td>
<td>Seminar 2 in Environmental Health</td>
<td></td>
</tr>
<tr>
<td>&amp; PHEH 752</td>
<td>Seminar 3 in Environmental Health</td>
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<tr>
<td>&amp; PHEH 754</td>
<td>Seminar 4 in Environmental Health</td>
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<td>PHEP 602</td>
<td>Epidemiological Methods</td>
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<tr>
<td>PHST 620</td>
<td>Introduction to Statistical Computing</td>
<td>3</td>
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<tr>
<td>PHST 680</td>
<td>Biostatistical Methods I</td>
<td>3</td>
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<tr>
<td>PHTX 625</td>
<td>Scientific Writing</td>
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</tr>
</tbody>
</table>

**Electives (see below)**

| Minimum Total Hours | 39 |

Students are required to complete the four seminars in environmental health for a total of four (4) credit hours but will continue to participate in the seminars until completion of their degree. Courses are jointly taught by the department faculty and are designed for a collegial experience providing an opportunity to integrate learning from other courses, discuss hot topics, brainstorm about research ideas, and acquire professional skills in scientific manuscript and grant writing, oral and poster presentations, and peer-review.

Students who have not received a Master of Public Health (MPH) degree from an accredited U.S. School of Public Health are required to take PPHP 523 Public Health in the United States as one of their elective courses.

**Electives**

As a part of the approved program of study, a student has the option to select 12 credit hours of elective coursework. 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 need for specific research methods and statistics skills varies by research topic, requirements in these areas 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 the 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.
Public Health Sciences: Specialization in Environmental Health (PhD)

Qualifying Examination
Upon completion of the majority of the required coursework for the PhD (typically after the second year of coursework), 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. Students must take the exam within three months of the completion of all courses for the PhD program.

A student who does not successfully complete the exam may be required to take additional or remedial coursework. A student who fails the exam on the first attempt is allowed one opportunity to retake the exam no more than six months after the initial exam, at a date mutually agreed upon by the faculty and student. Failure on the second attempt is grounds for dismissal from the program.

Successful completion of the examination admits the student to doctoral candidacy (DOCT 600) until the completion of their dissertation.

Dissertation
A dissertation is required of a candidate for the degree of Doctor of Philosophy in Public Health Sciences, 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. The dissertation must follow the guidelines of the Graduate School (http://louisville.edu/graduate/current-students/thesis-dissertation-information).

Dissertation Committee
The dissertation shall be reviewed 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. If the faculty advisor has a primary appointment outside EOHS, the EOHS department chair will co-chair the committee. This committee shall consist of a minimum of four members, and must include at least two members with a primary appointment in EOHS and at least one representative with a primary appointment outside of EOHS. 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 to all members of the dissertation committee a written dissertation proposal describing the proposed research in NIH grant proposal format. 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 Graduate School (http://louisville.edu/graduate/current-students/thesis-dissertation-information).

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. 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 the Graduate School using the online form (http://louisville.edu/graduate/current-students/thesis-dissertation-information). The time and place for the defense is published by the Graduate School to the general academic community, members of which are free to attend the defense. The dissertation is assessed by a standardized rubric and 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. The 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. The document is submitted 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. The completed signature page is submitted on white paper, with original signatures, to the Graduate School.