EPIDEMIOLOGY, DOCTOR OF PHILOSOPHY (PH.D.)

Program mission
The mission of the Ph.D. program in epidemiology is to train students to become independent research scientists and leaders who can develop epidemiological methods and conduct outstanding population-based research.

Program goals
1. Critical foundation skills: The program is designed to provide students with the critical skills required to advance to positions as epidemiological researchers/trainers in a broad spectrum of positions.
2. Mastery and application of science: The structure of the program provides a framework for the progressive development of a mastery of the current state of the subject matter of epidemiology and ability to synthesize this information and apply this foundation to the identification of key areas of investigation/experimentation in bioscience.
3. Communication: Students will develop skills in the various means of communicating both the core of epidemiological knowledge and the expression of epidemiological methodology, research design, results and interpretation to a variety of potential audiences.

Student learning outcomes
Students in the doctoral program in epidemiology will develop competencies in the following areas, as described below.

1. Critically evaluate public health and medical literature, identify gaps and formulate an epidemiologic research question addressing a literature gap
2. Develop a research project that addresses an important public health or clinical question using appropriate advanced epidemiologic methods, and discuss related strengths and limitations
3. Conduct quantitative data analysis using advanced statistical techniques and software, summarize the results and draw appropriate conclusions.
4. Design and write an original research grant proposal for reviewed funding in the student’s selected area of interest.

VCU Graduate Bulletin, VCU Graduate School and general academic policies and regulations for all graduate students in all graduate programs
The VCU Graduate Bulletin website documents the official admission and academic rules and regulations that govern graduate education for all graduate programs at the university. These policies are established by the graduate faculty of the university through their elected representatives to the University Graduate Council.

It is the responsibility of all graduate students, both on- and off-campus, to be familiar with the VCU Graduate Bulletin as well as the Graduate School website and academic regulations in individual school and department publications and on program websites. However, in all cases, the official policies and procedures of the University Graduate Council, as published on the VCU Graduate Bulletin and Graduate School websites, take precedence over individual program policies and guidelines.

Visit the academic regulations section for additional information on academic regulations for graduate students.

Degree candidacy requirements
A graduate student admitted to a program or concentration requiring a final research project, work of art, thesis or dissertation, must qualify for continuing master’s or doctoral status according to the degree candidacy requirements of the student’s graduate program. Admission to degree candidacy, if applicable, is a formal statement by the graduate student’s faculty regarding the student’s academic achievements and the student’s readiness to proceed to the final research phase of the degree program.

Graduate students and program directors should refer to the following degree candidacy policy as published in the VCU Graduate Bulletin for complete information and instructions.

Visit the academic regulations section for additional information on degree candidacy requirements.

Graduation requirements
As graduate students approach the end of their academic programs and the final semester of matriculation, they must make formal application to graduate. No degrees will be conferred until the application to graduate has been finalized.

Graduate students and program directors should refer to the following graduation requirements as published in the Graduate Bulletin for a complete list of instructions and a graduation checklist.

Visit the academic regulations section for additional information on graduation requirements.

Apply online at sophas.org (http://www.sophas.org/).

Admission requirements

<table>
<thead>
<tr>
<th>Degree:</th>
<th>Semester(s) of entry:</th>
<th>Deadline dates:</th>
<th>Test requirements:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ph.D.</td>
<td>Fall</td>
<td>Feb 1 (application strongly encouraged by this date)</td>
<td>GRE, TOEFL/IELTS</td>
</tr>
</tbody>
</table>

Special requirements
- Applicants must hold a master’s degree, preferably in the health or social sciences, including, but not limited to, public health, and provide test scores as detailed below. Applicants must provide all required materials as described herein and in the VCU Admissions graduate application checklist.

In addition to the general admission requirements of the VCU Graduate School (http://bulletin.vcu.edu/graduate/study/admission-graduate-study/admission-requirements/), applicants must meet the following minimum qualifications.
1. Prior degree: Master’s degree in the health or social sciences, including, but not limited to, public health (M.P.H.), with a minimum GPA of 3.0
2. GRE: Current GRE test results (taken within the past five years) with scores at or above the 75th percentile preferred in all components of the exam (e.g., minimum scores of 159 quantitative, 157 verbal and 4.5 analytical writing)
3. TOEFL: For non-native speakers of English, recommended minimum scores of either 100iBT, 600 PBT or IELTS scores of 6.5 (academic band score)
4. Personal statement: Applicants must include a personal statement that indicates: (1) their reasons for pursuing a doctoral degree in epidemiology, (2) their particular areas of research focus or study, (3) the departmental faculty advisers with whom the students would prefer to work and (4) career goals upon graduation.
5. Reference letters: Students must submit three letters of recommendation from three individuals who can assess the applicant’s qualifications for graduate school. Letters from past professors or faculty advisers are most appropriate.
6. Current CV or resume: Students must submit a current CV or resume.

**Degree requirements**

In addition to the general VCU Graduate School graduation requirements (http://bulletin.vcu.edu/academic-regs/grad/graduation-info/), students will be required to complete a minimum of 61 graduate credit hours as follows:

1. Four core courses focusing on epidemiological methods (12 credit hours)
2. Two core courses focusing on biostatistical theory and methods (six credit hours)
3. Four semesters of journal club (four credit hours)
4. Three courses of methodological electives (nine credit hours)
5. Three courses of substantive area electives, with at least one relating to the biological processes associated with the student’s chosen substantive area (nine credit hours)
6. A minimum of two credit hours of practical research skills development
7. At least one course in the responsible conduct of research (one credit hour)
8. At least 18 credit hours of directed dissertation research

Students will also be required to complete the following:

**Practical experience**

1. Assistantship: All doctoral students are required to work an average of 20 hours per week under the direction of their adviser as part of experiential program training. This 20-hour-per-week requirement is met by work in a research assistantship and at least one semester of a teaching assistantship.
   a. Research assistantship: Research program support exposes students to a variety of aspects of developing and implementing research plans and programs. Work includes drafting manuscripts or preparing presentations for refereed conferences, conducting research activities in the community, traveling to attend research team meetings, or regular work with research team members.
   b. Teaching assistantship: All doctoral students are required to serve as teaching assistants for at least one semester before graduation. The student and her/his adviser discuss and select the course that is best-suited for the teaching assistantship. During the semester(s) when students engage in the teaching assistantship, teaching hours count toward the experiential training requirement and are combined with research hours to meet the expected 20-hour-per-week training time.
2. Seminar attendance: All students are expected to attend all doctoral level Division of Epidemiology seminars during their tenure in the program. These seminars are generally held every other week during fall and spring semesters. In addition, students must attend any special public health seminars offered collaboratively by the public health departments. These special seminars may occur one to two times each semester.
3. Grant application submission: All students are expected to submit at least one grant application related to their dissertation to a federal agency or nongovernmental organization (according to student eligibility) to gain grantsmanship experience. The adviser guides the student on the timing for submission of this grant application and the appropriate funding organization or agency.

**Comprehensive examinations**

Comprehensive examinations include a written examination and an oral candidacy examination. The written examination assesses knowledge of completed didactic course work on core epidemiological and biostatistical methods as well as a tailored substantive section based on the student’s research focus. The oral candidacy examination is based upon the student’s dissertation proposal, which consists of three proposed research projects.

**Written comprehensive examination**

Students are expected to take the written comprehensive examination after completing all didactic program courses (typically the program core, a practical research skills course, a responsible conduct of research course and 18 credits of elective course work). Program expectation for satisfactory academic progress is that students complete the written comprehensive examination by the end of the second academic year (i.e., no later than the end of the second summer semester). Exceptions beyond this time limit must be approved by the student’s adviser and the graduate program director based on the student’s submission of a written explanation for the delay in progress. This written explanation must include a plan of action and schedule for completing the written comprehensive examination by the date approved by the student’s faculty adviser.

**Oral candidacy examination**

After passing the written comprehensive examinations, the student is eligible for the oral candidacy examination. For this examination, the student prepares background and methods for three proposed research projects in a focused area of dissertation research.

To maintain satisfactory academic progress in the program, students should complete the oral candidacy examination by the end of third fall semester. Exceptions beyond this time limit must be approved by the student’s committee and the graduate program director based on the student’s submission of a written explanation for the delay in progress. This written explanation must include a plan of action and schedule for completing the oral candidacy examination by the date approved by the student’s dissertation adviser.
Upon successful completion of the oral candidacy examination, the student will embark upon the dissertation research.

**Dissertation**

1. The dissertation must be a hypothesis-based, analytical epidemiology project designed by the student under the supervision of the faculty adviser and dissertation advisory committee members as appropriate. The dissertation consists of a minimum of three papers prepared in manuscript style and suitable for submission to a peer-reviewed journal.
2. The student submits at least one of the three manuscripts from the dissertation to a peer-reviewed journal before the student schedules the final defense.

To maintain satisfactory academic progress in the program, students should schedule the dissertation examination by the second semester of the fourth year. Exceptions beyond this time limit must be approved by the student’s committee and the graduate program director based on the student’s submission of a written explanation for the delay in progress. Plans for completion of the dissertation examination will be considered on an individual basis. Failure to maintain satisfactory academic progress may result in a grade of U (unsatisfactory) for the dissertation work.

**Public Health Learning Objectives**

In addition to meeting VCU Graduate School and program requirements for graduation, all students enrolled in the School of Population Health must demonstrate competence in foundational public health learning objectives. This requirement is waived for students who previously completed a CEPH-accredited degree at the bachelor’s, master’s, or doctoral level.

**Satisfactory academic progress**

Satisfactory academic progress may be assessed on multiple factors, including progress on dissertation development in accordance with timelines established between the student and adviser and/or committee; lack of professional conduct, including communication lapses or failure to communicate with the adviser and/or committee about delays in progress and/or absence from research work; honor policy violations or academic misconduct; and failure to maintain continuous enrollment without an approved leave of absence.

**Course requirements**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td><strong>Required core courses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIOS 602</td>
<td>Analysis of Biomedical Data II</td>
<td>3</td>
</tr>
<tr>
<td>EPID 649</td>
<td>Analysis of Health Datasets</td>
<td>3</td>
</tr>
<tr>
<td>EPID 650</td>
<td>Epidemiologic Methods for Research</td>
<td>3</td>
</tr>
<tr>
<td>EPID 651</td>
<td>Intermediate Epidemiologic Methods for Research</td>
<td>3</td>
</tr>
<tr>
<td>EPID 652</td>
<td>Advanced Epidemiologic Methods and Data Analysis</td>
<td>3</td>
</tr>
<tr>
<td>EPID 690</td>
<td>Journal Club (taken four semesters)</td>
<td>4</td>
</tr>
<tr>
<td>STAT 643</td>
<td>Applied Linear Regression</td>
<td>3</td>
</tr>
<tr>
<td><strong>Required additional courses</strong></td>
<td></td>
<td></td>
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<tr>
<td>Practical research skills development: Select a minimum of two credits from the following.</td>
<td>2</td>
<td></td>
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<tr>
<td>ALHP 716</td>
<td>Grant Writing for Health Science Research</td>
<td></td>
</tr>
</tbody>
</table>

**Elective courses**

Methodological electives: Select nine credits from the following.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOS 549</td>
<td>Spatial Data Analysis</td>
</tr>
<tr>
<td>BIOS 632</td>
<td>Multivariate Analysis</td>
</tr>
<tr>
<td>BIOS 635</td>
<td>Structural Equation Modeling</td>
</tr>
<tr>
<td>BIOS 668</td>
<td>Statistical Methods for High-throughput Genomic Data II</td>
</tr>
<tr>
<td>BIOS 671</td>
<td>Nonlinear Models</td>
</tr>
<tr>
<td>BNFO 601</td>
<td>Integrated Bioinformatics</td>
</tr>
<tr>
<td>CCTR 630</td>
<td>Design Implications in Clinical Trials</td>
</tr>
<tr>
<td>CCTR 631</td>
<td>Adaptive Clinical Trials</td>
</tr>
<tr>
<td>CCTR 692</td>
<td>Special Topics in Translational Research</td>
</tr>
<tr>
<td>EPID 620</td>
<td>Cancer Epidemiology</td>
</tr>
<tr>
<td>EPID 622</td>
<td>Maternal and Child Health</td>
</tr>
<tr>
<td>EPID 623</td>
<td>Injury and Violence Epidemiology</td>
</tr>
<tr>
<td>EPID 646</td>
<td>Epidemiology of Psychiatric and Substance Use Disorders</td>
</tr>
<tr>
<td>EPID 692</td>
<td>Independent Study</td>
</tr>
<tr>
<td>HADM 763</td>
<td>Applied Health Services Research</td>
</tr>
<tr>
<td>HCPR 730</td>
<td>Survey Research Methods and Analysis for Health Policy</td>
</tr>
<tr>
<td>HGEN 603</td>
<td>Mathematical and Statistical Genetics</td>
</tr>
<tr>
<td>HGEN 617</td>
<td>Genetic Analysis of Complex Traits</td>
</tr>
<tr>
<td>HGEN 619</td>
<td>Quantitative Genetics</td>
</tr>
<tr>
<td>PHAR 688</td>
<td>Applied Pharmacoepidemiology Research Methods</td>
</tr>
<tr>
<td>PPAD 723</td>
<td>Survey Research Methods</td>
</tr>
<tr>
<td>PSYC 655</td>
<td>Community Interventions: Development, Implementation and Evaluation</td>
</tr>
<tr>
<td>SBHD 610</td>
<td>Behavioral Measurement</td>
</tr>
<tr>
<td>SBHD 631</td>
<td>Disseminating, Adopting and Adapt ing Evidence-based Prevention Programs</td>
</tr>
<tr>
<td>SBHD 633</td>
<td>Structural Equation Modeling</td>
</tr>
<tr>
<td>SBHD 636</td>
<td>Community-based Participatory Research</td>
</tr>
<tr>
<td>SBHD 637</td>
<td>Program Evaluation</td>
</tr>
<tr>
<td>SBHD 638</td>
<td>Applications in Qualitative Research Methods</td>
</tr>
</tbody>
</table>
Epidemiology, Doctor of Philosophy (Ph.D.)

**SOCY 656** Social Network Analysis

**URSP 521** Introduction to Geographic Information Systems

**URSP 621** Introduction to Geographic Information Systems

**URSP 622** Community Socioeconomic Analysis Using GIS

**URSP 625** Spatial Database Management and GIS Modeling

**URSP 627** GIS Applications in Urban Design

Substantive area electives: Select three courses of substantive area electives, at least one relating to the biological processes associated with the student’s chosen substantive area from the following.

**EPID 603** Public Health Policy and Politics

**EPID 620** Cancer Epidemiology

**EPID 622** Maternal and Child Health

**EPID 623** Injury and Violence Epidemiology

**EPID 645** Public Health Genomics

**EPID 646** Epidemiology of Psychiatric and Substance Use Disorders

**EPID 691** Special Topics

**EPID 692** Independent Study

**GRTY 601** Biological and Physiological Aging

**GRTY/PSYC 602** Psychology of Aging

**GRTY 603** Social Gerontology

**GRTY 604** Problems, Issues and Trends in Gerontology

**GRTY 606** Aging and Human Values

**GSWS 620** Theorizing Sexuality

**HADM 602** Health System Organization, Financing and Performance

**HADM 611** Health Care Law and Bioethics

**HADM 615** Health Care Politics and Policy

**HADM 624** Health Economics

**HADM 704** Foundations of Health Service Organization Theory

**HADM 705** Seminar in Health Services and Organizational Research

**HCPR 610** Foundations in Health Services Research Methods

**HCPR 701** Health Services Research and Policy I

**HCPR 702** Health Services Research and Policy II

**HCPR 720** Social and Economic Determinants of Health Disparities

**HGEN 501** Introduction to Human Genetics

**HGEN 502** Advanced Human Genetics

**HGEN 610** Current Literature in Human Genetics

**HGEN 620** Principles of Human Behavioral Genetics

**HSEP 603** Risk Assessment

**HSEP 650** Public Health Preparedness

**NURS 502** Advanced Pharmacology

**PSYC 629** Biological Basis of Behavior

**PSYC 630** Social Psychology

**PSYC 660** Health Psychology

**PSYC 679** Culture, Ethnicity and Health

**SBHD 611** Health Literacy

**SBHD 630** Theoretical Foundations of Social and Behavioral Health

**SBHD 631** Disseminating, Adopting and Adapting Evidence-based Prevention Programs

**SBHD 632** Health Disparities and Social Justice

**SBHD 634** Patient-Provider Interaction

**SBHD 637** Program Evaluation

**SLWK 746** Social Work Practice and Psychopharmacology

**SLWK 761** Interpersonal Violence in Clinical Social Work Practice

Dissertation research

**EPID 697** Directed Research in Epidemiology

Total Hours 61

The minimum number of graduate credit hours required for this degree is 61.

Students who complete the requirements for this degree will receive a Doctor of Philosophy in Epidemiology.

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