

# Milken Institute School of Public Health

THE GEORGE WASHINGTON UNIVERSITY

## PhD Epidemiology 2024-2025

Note: All curriculum revisions will be updated  
immediately on the website  
<http://publichealth.gwu.edu>

**Application Due Date: December 1st**

### PROGRAM DIRECTOR

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### MISSION

The mission of the Epidemiology PhD program in the Milken Institute School of Public Health at the George Washington University is to prepare students for a career in epidemiologic research in an academic, government, or industry settings.

### PROGRAM GOALS

The goals of the PhD program are to ensure graduates:

- Gain knowledge across a wide range of epidemiologic theories and methods;
- Gain specific knowledge of epidemiology in one or more of the following areas: infectious disease, chronic disease, environmental and occupational health, or physical activity;
- Understand general and specialized advanced epidemiologic concepts;
- Understand how to apply statistical methods to biological/biomedical sciences and health services;
- Understand and abide by guidelines for ethical treatment of research participants;
- Conduct and analyze data from a research study;
- Disseminate research findings to scientific and lay audiences.

### PROGRAM REQUIREMENTS

Students will complete this 48-credit program by taking Foundational Courses, Required Courses, Tailoring Courses, and credit hours focused on Proposal Writing and Dissertation Research. Doctoral students are required to pass a written comprehensive examination and complete a dissertation. For the comprehensive examination the student must demonstrate advanced knowledge of epidemiologic and biostatistical methods. For the dissertation, the student must design and execute an original research study that contributes new knowledge to the field and demonstrates proficiency in using advanced analytic methods.

## COMPETENCIES

At the completion of the doctoral program in epidemiology students will be able to:

- Demonstrate knowledge of advanced epidemiologic concepts including assessment of bias, confounding, issues with measurement, and modeling
  - Courses: PUBH 6252, PUBH 8419, PUBH 8877, PUBH 8999
- Design epidemiological research studies including identification and development of data sources and data collection instruments and recognition of measurement issues
  - Courses: PUBH 6241; PUBH 6247; PUBH 6252; PUBH 6866, PUBH 6869, PUBH 8283, PUBH 8419, PUBH 8435, PUBH 8999
- Evaluate published epidemiologic and biomedical research and identify gaps and/or limitations of the research
  - Courses: PUBH 6247; PUBH 6252, PUBH 8099; PUBH 8435; PUBH 8999
- Conduct, evaluate, and interpret statistical analysis and assess data collection instruments
  - Courses: PUBH 6252, 6865, PUBH 6866, PUBH 6869, PUBH 8283, PUBH 8364, PUBH 8419, PUBH 8877, PUBH 8999
- Disseminate and communicate epidemiological research findings
  - Courses: PUBH 6247, PUBH 6252, PUBH 8099, PUBH 8999

## ADMISSIONS REQUIREMENTS

The Doctor of Philosophy Program is intended for professionals seeking to become public health researchers. Applicants who have completed an MPH degree from a Council of Education for Public Health (CEPH) accredited Program/School, or who hold a graduate degree in a related field will be considered for admission to the PhD Program. Applicants may indicate their relevant training, work and/or research experience, or educational background that may have prepared them for doctoral level training in Public Health. As an accredited School of Public Health, the curriculum in all graduate academic programs must provide a foundation in public health. All graduate students without a prior degree from a CEPH-accredited school/program of public health will be required to successfully pass the zero-credit, free, online Pathways to Public Health (PUBH 6080) course within one year of matriculation. For the PhD, qualified applicants with degrees from institutions in foreign countries are also eligible for admission. All applicants must submit scores from the Graduate Record Exam (GRE) taken within five years of the date of application. Because admission to this program is highly selective, successful applicants should have competitive academic credentials and substantial prior public health professional work experience related to the specialty field to which they are applying. Applicants should be aware that graduate courses taken prior to admission while in non-degree status may not be transferable into those programs.

## **REQUIRED COURSES PRIOR TO ADMISSION CONSIDERATION (or equivalents to these GW courses)**

The courses listed below (or equivalents) are required prior to admission consideration and **MUST** clearly appear on an undergraduate or graduate transcript by name, credit hour, and letter grade.

|      |           |  |   |   |
|------|-----------|--|---|---|
| PUBH | 6003      | Principles and Practices of Epidemiology   | 3 | General principles, methods, and applications of epidemiology. Outbreak investigations, measures of disease frequency, standardization of disease rates, study design, measures of association, hypothesis testing, bias, effect modification, causal inference, disease screening, and surveillance. |
| BISC | 1111/1112 | Introductory Biology: Cells and Molecules  | 4 | Lecture (3 hours), laboratory (1 credit/3 hours). Cellular and developmental biology, genetics, and molecular biology.  |
| BISC | 1116/1126 | Introductory Biology: Biology of Organisms | 4 | Lecture (3 hours), laboratory (1 credit/3 hours). Concepts and methods in the study of whole organisms. Evolutionary theory; population biology; diversity of animals, fungi, and microorganisms; ecology and behavior; and animal structure and function.  |
| MATH | 1231      | Single-Variable Calculus I                 | 3 | Limits and continuity. Differentiation and integration of algebraic and trigonometric functions with applications.  |
| MATH | 1232      | Single-Variable Calculus II                | 3 | The calculus of exponential and logarithmic functions. L'Hopital's rule. Techniques of integration. Infinite series and Taylor series. Polar coordinates. Prerequisite: Math 1231   |

**PREREQUISITE COURSES FOR ADMISSION CONSIDERATION (or equivalents to these GW courses)**

The courses listed below are additional prerequisite course requirements. Applicants lacking these courses (or equivalents to these GW courses) will be considered for admission but will only be admitted conditionally with the expectation that these courses will be completed within the first semester following matriculation in the program. Credits for these courses do not count toward the 48-credit graduation requirement, nor are grades earned in these additional courses reflected in the overall grade-point average.

|              |      |   |           |  |
|--------------|------|---|-----------|--|
| MATH         | 2184 | Linear Algebra I  | 3         | Linear equations, matrices, inverses, and determinants. Vector spaces, rank, eigenvalues, and diagonalization. Applications to geometry and ordinary differential equations. Prerequisite: MATH 1231   |
| STAT         | 2183 | Intermediate Statistical Laboratory: Statistical Computing Packages | 3         | Application of program packages (e.g., SAS, SPSS) to the solution of one-, two- and k-sample parametric and nonparametric statistical problems. Basic concepts in data preparation, modification, analysis and interpretation of results. Prerequisite: an introductory statistics course.   |
| -or-<br>PUBH | 6853 | Use of Statistical Packages: Data Management and Data Analysis      | -or-<br>3 | This course familiarizes the student with one of the most widely used database management systems and statistical analysis software packages, the SAS System, operating in a Windows environment. Throughout the course, several database management system techniques and data analytical strategies for the appropriate analysis of datasets obtained from a variety of studies will be presented. Statistical techniques covered include linear regression, analysis of variance, logistic regression, and survival analysis. |

Students without a prior degree from a CEPH-accredited school or program of public health will be required to successfully pass the zero-credit, online course *Pathways to Public Health (PUBH 6080)* within one year of matriculation. There is no fee for this course.

**PhD EPIDEMIOLOGY DEGREE REQUIREMENTS**

| <b>Course Distribution Summary</b>  | <b>Credits</b> |
|---|----------------|
| Required PhD Foundation Courses   | 5              |
| Required Program Specific Courses   | 19             |
| Tailoring Courses   | 12             |
| Proposal writing<br><i>Note: may be waived and credits replaced with dissertation credits with permission of Program Director</i> | 2              |
| Dissertation Research   | 10             |
| <b>Students have 7 years to complete all degree requirements from matriculation.</b>  | <b>48</b>      |

**Required PhD Foundation Credits  
5 Credits**

|           |  | <b>Credits</b> | <b>Semester Offered</b> |
|-----------|--|----------------|-------------------------|
| PUBH 6080 | Pathways to Public Health*   | 0              | Fall, Spring, Summer    |
| PUBH 6421 | Responsible Conduct of Research  | 1              | Fall, Summer            |
| PUBH 6247 | Epidemiologic Methods 1: Design of Health Studies**<br><b>Basis for PhD General Comprehensive Exam</b> | 3              | Fall, Spring            |
| PUBH 8001 | PhD Seminar- Cross Cutting Concepts in Public Health   | 1              | Fall                    |

**Required Program Specific Courses  
19 credits**

|           |  |   |              |
|-----------|--|---|--------------|
| PUBH 6252 | Epidemiologic Methods 2: Advanced Epidemiologic Methods<br><b>Basis for PhD General Comprehensive Exam</b> | 3 | Fall, Spring |
| PUBH 6865 | Applied Categorical Data Analysis  | 3 | Spring       |
| PUBH 6866 | Principles of Clinical Trials  | 3 | Spring       |
| PUBH 6868 | Quantitative Methods   | 3 | Spring       |
| PUBH 6869 | Principles of Biostatistics Consulting-can be waived and replaced with electives or dissertation credit    | 1 | Spring       |
| PUBH 8419 | Measurement in Public Health and Health Services<br><b>Basis for PhD General Comprehensive Exam</b>        | 3 | Spring       |
| PUBH 8877 | Generalized Linear Models in Biostatistics<br><b>Basis for PhD General Comprehensive Exam</b>              | 3 | Fall         |

**Tailoring Courses  
Minimum 12 Credits**

**Any PUBH or STAT graduate level course (all prerequisites must be met)  
(Other elective courses outside of SPH may be taken with advanced approval)**

| <b>Epidemiology Elective Courses-Sample list (not exclusive)</b> |                              | <b>Credits</b> | <b>Semester Offered</b> |
|--|------------------------------|----------------|-------------------------|
| PUBH 62xx  | Epidemiology Topical Courses | 1-3            | Summer, Fall, Spring    |

|                  |   |     |        |
|------------------|---|-----|--------|
| PUBH 6242 + 8242 | Clinical Epidemiology and Public Health: Reading the Research + Doctoral Topics | 2+1 | Spring |
| PUBH 6244+ 8244  | Cancer Epidemiology + Doctoral Topics   | 2+1 | Spring |
| PUBH 6245 + 8245 | Infectious Disease Epidemiology + Doctoral Topics                               | 2+1 | Spring |
| PUBH 6250+ 8250  | Epidemiology of HIV/AIDS +Doctoral Topics                                       | 2+1 | Fall   |
| PUBH 6259+8259   | Epidemiologic Surveillance in Public Health +Doctoral Topics                    | 2+1 | Spring |

| <b>Biostatistics Elective Courses – Sample list (not exclusive)</b> |   | <b>Credits</b>  | <b>Semester Offered</b>                              |
|---|---|---|--|
| PUBH 6862   | Applied Linear Regression Analysis for Public Health Research   | 3   | Fall   |
| PUBH 6864   | Applied Survival Analysis for Public Health Research <sup>84</sup>  | 3   | Spring   |
| PUBH 6887   | Applied Longitudinal Data Analysis for Public Health Research   | 3   | Spring   |
| PUBH 6860   | Principles of Bioinformatics  | 3   | Fall   |
| PUBH 6861   | Public Health Genomics  | 3   | Spring   |
| PUBH 68xx   | Biostatistics and Bioinformatics Topical Courses  | 1-3   | Summer, Fall, Spring                                 |
| PUBH 8878   | Statistical Genetics  | 3   | Spring   |
| <b>Dissertation Research<br/>12 Credits</b>                         |   |   |  |
| PUBH 8210   | Professional Skills Enhancement for Doctoral Students in Epidemiology   | 0   | Yearlong following completion of comprehensive exams |
| PUBH 8435   | PhD Proposal Development<br>(Note: May be waived by the Program Director. Waiver of the course credits replaced by dissertation credits.) | 2   | Fall, Spring   |
| PUBH 8999   | Dissertation Research for PhD Epidemiology Students   | 10 credits taken in units of 3 credits until final semester | Summer, Fall, Spring                                 |

*\*Pathways to Public Health (PUBH 6080) may be waived for students who matriculate with a prior degree from a CEPH-accredited institution.*

*\*\*Students with an MPH and an equivalent course may waive and replace this course with elective credits.*

**Course Descriptions and Registration** information can be found on the website:  
<http://publichealth.gwu.edu/academics/>

## PHD GRADUATION REQUIREMENTS

### Graduation

While degrees are awarded at the end of each semester, formal commencement ceremonies occur only in May, including the doctoral hooding ceremony. Students are eligible to participate in graduation activities only after they have completed all degree requirements and have no financial obligations to the University. Students may include PhD designation after their name upon completion of all degree requirements.

### Graduation Requirements

1. Credits: Successful completion of 48 credits.
2. Curriculum: Successful completion of program requirements and elective coursework.
3. General examination: Once the course of study is completed, students are required to pass the General examination Part I.
4. Dissertation: 9 credits in dissertation research are required. Once the proposal has been successfully defended (General Examination Part II) and the dissertation research credit requirement has been met, the oral defense may be scheduled.
5. Students must complete GE Parts I and II and have the dissertation proposal approved by the IRB to be officially admitted to the candidacy phase.
6. Grade point average: A minimum overall grade-point average of *B* (3.0).
7. Time limit: The degree must be completed within seven years of matriculation.
8. CITI Training requirement: All students are required to complete training regarding human subject protection regulation and the Health Insurance Portability and Accountability Act of 1996 (HIPAA). To fulfill this requirement, you must complete the Collaborative IRB Training Initiative (CITI) Course in The Protection of Human Research Subjects.
9. Integrity Quiz & Plagiarism requirement: All students are required to review the George Washington University Code of Academic Integrity, take the quiz within their first semester of study, and ensure documentation is submitted to the SPH Office of Student Records.
10. Professional Enhancement requirement: Students must attend/participate in 8 hours of epidemiology conferences. To be cleared for graduation, students are required to submit required documentation of applicable Professional Enhancement activities to the SPH Office of Student Records.