Epidemiology, Ph.D.

Epidemiology is the scientific discipline primarily concerned with identifying the distribution and causes of disease in populations. It encompasses a rich methodology including observational and experimental study designs, statistical methods, an understanding of pathogens, environmental and behavioral risk factors, and human biology. Epidemiological methods have evolved to meet threats of global infectious diseases and the complex health challenges presented by an aging population, as well as to capitalize on the expanding understanding of human genetics. As the fundamental discipline of public health, epidemiology provides essential knowledge to design, implement, and assess approaches to effectively prevent disease and improve quality of life in the population.

The research-oriented degree programs are designed to provide rigorous training to develop students’ abilities to synthesize knowledge and skills needed to address today’s health-related problems. Faculty, staff, and students in the Department of Population Health Sciences engage in a wide variety of epidemiological and health services world-class research projects. The interdisciplinary focus allows students the flexibility to work with a wide array of research/faculty on campus.

The department offers two graduate degree programs: an M.S. and a Ph.D. in epidemiology and an M.S. and Ph.D. in population health. While the program is based on a sequence of core courses, students, in consultation with their major professor, have some flexibility to design advanced study and research that best prepares them for their chosen area of interest.

Admissions

Applications are welcome from students with diverse academic backgrounds. Students with strong quantitative skills and academic preparation in the biological sciences are strongly encouraged to apply. New students are admitted to start in the fall semester of each school year. Applications are due by January 15 of each year. Late applications are not accepted.

Minimum requirements are:

- Applicants must have an undergraduate degree with a grade point average of 3.0 (on a 4.0 scale), although successful applicants generally have GPAs above 3.0.
- GRE scores are required for admission. The scores must be no more than five years old at the time of application. For applicants who have completed a doctoral degree, GRE scores are preferred but the program will accept scores for the entrance exam required for the doctoral degree (e.g., MCAT, LSAT). Students should contact the graduate program coordinator to find out if their scores are competitive.
- Applicants whose native language or language of study is not English must submit official TOEFL scores. Scores must be no more than five years old at the start of the semester for which an applicant is applying. Further details are available on the Graduate School website. Note that the minimum test scores for the program are higher than those required by the Graduate School. For the Test of English as a Foreign Language, TOEFL minimum scores of 580 (written), 237 (computer-based), or 92 (Internet-based) or above are required.
- Transcripts must show evidence of quantitative preparation, including at least one semester of calculus as well as a two-semester courses in college-level biology. A personal statement and three letters of recommendation are required. Applicants must meet both the above departmental admission requirements and the Graduate School admission requirements.
- Upon entry to the graduate program, students are matched with a faculty advisor. Faculty advisors helps students hone their interests, assists with identifying research projects, provide support for career development, and link students to the greater campus community. Students have the benefit of regular dialogues with faculty members. Seminars and integrated discussion groups allow for increased interaction with core faculty and community lecturers. Finally, the work of students is valued as evidenced by their entries in the annual department poster session, participation in public health symposia, authorship of publications, and involvement in community/research projects.

Graduate School Admissions

Graduate admissions is a two-step process between academic degree programs and the Graduate School. Applicants must meet requirements of both the program(s) and the Graduate School. Once you have researched the graduate program(s) you are interested in, apply online.

Funding

Graduate School Resources

Resources to help you afford graduate study might include assistantships, fellowships, traineeships, and financial aid. Further funding information is available from the Graduate School. Be sure to check with your program for individual policies and processes related to funding.

Program Resources

Students admitted to our degree programs are automatically considered for any available scholarships, traineeships, or graduate assistant positions in the department. The most common forms of funding support for our students are assistantships, traineeships, and fellowships.

Requirements

Minimum Graduate School Requirements

Review the Graduate School minimum academic progress and degree requirements, in addition to the program requirements listed below.

Major Requirements

Mode of Instruction

<table>
<thead>
<tr>
<th>Mode of Instruction</th>
<th>Face to Face</th>
<th>Evening/Weekend</th>
<th>Online</th>
<th>Hybrid</th>
<th>Accelerated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>


**Mode of Instruction Definitions**

- **Evening/Weekend:** These programs are offered in an evening and/or weekend format to accommodate working schedules. Enjoy the advantages of on-campus courses and personal connections, while keeping your day job. For more information about the meeting schedule of a specific program, contact the program.

- **Online:** These programs are offered primarily online. Many available online programs can be completed almost entirely online with all online programs offering at least 50 percent or more of the program work online. Some online programs have an on-campus component that is often designed to accommodate working schedules.

- **Hybrid:** These programs have innovative curricula that combine on-campus and online formats. Most hybrid programs are completed on-campus with a partial or completely online semester. For more information about the hybrid schedule of a specific program, contact the program.

- **Accelerated:** These on-campus programs are offered in an accelerated format that allows you to complete your program in a condensed time-frame. Enjoy the advantages of on-campus courses with minimal disruption to your career. For more information about the accelerated nature of a specific program, contact the program.

**CURRICULAR REQUIREMENTS**

<table>
<thead>
<tr>
<th>Minimum</th>
<th>65 credits</th>
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</thead>
<tbody>
<tr>
<td><strong>Credit Requirement</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Minimum Residence Credit Requirement</strong></td>
<td>53 credits</td>
</tr>
<tr>
<td><strong>Minimum Graduate Coursework Requirement</strong></td>
<td>Half of degree coursework must be completed graduate-level coursework; courses with the Graduate Level Coursework attribute are identified and searchable in the university's Course Guide.</td>
</tr>
<tr>
<td><strong>Overall Graduate GPA Requirement</strong></td>
<td>Students must maintain a cumulative GPA of at least 3.25 in all graduate work (including transfer credits) unless conditions for probationary status require higher grades. Students must also maintain a cumulative GPA of 3.25 or better in all coursework completed while enrolled in the population health graduate program. No grade of C- or lower in epidemiology required courses will be accepted for the degree.</td>
</tr>
<tr>
<td><strong>Other Grade Requirements</strong></td>
<td>Maintain no more than 6 credits of Incomplete (I) grades during any semester.</td>
</tr>
<tr>
<td><strong>Assessments and Examinations Requirements</strong></td>
<td>Full-time students have up until the end of their third year to pass the Qualifying Exam and their first sitting must occur no later than the end of their second year. Part-time students are expected to pass the exam before the end of their fourth year (regardless of whether the student is continuously enrolled) and their first sitting must occur no later than the end of their third year.</td>
</tr>
<tr>
<td><strong>Language Requirements</strong></td>
<td>No language requirements.</td>
</tr>
<tr>
<td><strong>Doctoral Minor/Breadth Requirements</strong></td>
<td>All doctoral students are required to complete a 10-credit minor.</td>
</tr>
</tbody>
</table>

**REQUIRED COURSES**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>POP HLTH/B M I 451</td>
<td>Introduction to SAS Programming for Population Health</td>
<td>2</td>
</tr>
<tr>
<td>POP HLTH/B M I 551</td>
<td>Introduction to Biostatistics for Population Health</td>
<td>3</td>
</tr>
<tr>
<td>POP HLTH/B M I 552</td>
<td>Regression Methods for Population Health</td>
<td>3</td>
</tr>
<tr>
<td>POP HLTH/B M I 651</td>
<td>Advanced Regression Methods for Population Health</td>
<td>3</td>
</tr>
<tr>
<td>POP HLTH/B M I 652</td>
<td>Topics in Biostatistics for Epidemiology</td>
<td>1-3</td>
</tr>
<tr>
<td>POP HLTH/SOC 797</td>
<td>Introduction to Epidemiology</td>
<td>3</td>
</tr>
<tr>
<td>POP HLTH 798</td>
<td>Epidemiologic Methods</td>
<td>3</td>
</tr>
<tr>
<td>POP HLTH 805</td>
<td>Advanced Epidemiology: Causal Inference in Epidemiological Studies</td>
<td>3</td>
</tr>
<tr>
<td>POP HLTH 806</td>
<td>Advanced Epidemiology: Practice of Epidemiology</td>
<td>3</td>
</tr>
<tr>
<td>POP HLTH 820</td>
<td>Graduate Research Seminar</td>
<td>1</td>
</tr>
</tbody>
</table>

Select a minimum of 1 credit of course work in "the responsible conduct of research" for biomedical graduate students.

Ph.D. students must complete at least 12 additional credits of specialization work from the list below.

See below for list of acceptable courses to satisfy the fourth-semester biostatistics requirement.

**Responsible Conduct of Research Courses**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MED HIST 545</td>
<td>Ethical and Regulatory Issues in Clinical Investigation (Offered in Fall. MED HIST 545 does not fulfill all the NIH requirements for training in the responsible conduct of research for certain T and F awards.)</td>
</tr>
<tr>
<td>NURSING 802</td>
<td>Ethics and the Responsible Conduct of Research (Offered in Spring)</td>
</tr>
<tr>
<td>SURG SCI 812</td>
<td>Research Ethics and Career Development</td>
</tr>
<tr>
<td>OBS&amp;GYN 955</td>
<td>Responsible Conduct of Research for Biomedical Graduate Students (Offered in Fall)</td>
</tr>
<tr>
<td>OBS&amp;GYN 956</td>
<td>Advanced Responsible Conduct of Research for Biomedical Students (Offered in Spring)</td>
</tr>
</tbody>
</table>

Other courses may be substituted as approved by the advisor and director of grad studies.

**Epidemiology Specialization Courses**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>M M &amp; I/</td>
<td>Clinical and Public Health</td>
<td>5</td>
</tr>
<tr>
<td>POP HLTH 603</td>
<td>Microbiology</td>
<td></td>
</tr>
<tr>
<td>POP HLTH/</td>
<td>Introduction to Nutritional Epidemiology</td>
<td></td>
</tr>
<tr>
<td>NUTR SCI 621</td>
<td></td>
<td></td>
</tr>
<tr>
<td>POP HLTH 650</td>
<td>Special Topics (Topic: Environ. Health Epidemiology)</td>
<td>1-6</td>
</tr>
</tbody>
</table>
POP HLTH 713  Epidemiology of HIV/AIDS  1
POP HLTH 750  Cancer Epidemiology  2-3
POP HLTH 780  Public Health: Principles and Practice  3
POP HLTH 786  Social and Behavioral Sciences for Public Health  3
POP HLTH/ M&ENVTOX 789  Principles of Environmental Health: A Systems Thinking Approach  3
POP HLTH/ KINES 791  Physical Activity Epidemiology  3
POP HLTH 801  Epidemiology of Infectious Diseases  3
POP HLTH 805  Advanced Epidemiology: Causal Inference in Epidemiological Studies  3
POP HLTH 806  Advanced Epidemiology: Practice of Epidemiology  3
POP HLTH/ OBS&GYN 807  Reproductive and Perinatal Epidemiology  2
POP HLTH 847  Cardiovascular Epidemiology  1
POP HLTH/AN SCI/ GENETICS 849  Genetic Epidemiology  3
POP HLTH/ GENETICS/ MD GENET 888  Public Health Genomics  1
POP HLTH 904  Special Topics in Epidemiology  1-3
POP HLTH/ KINES 955  Seminar - Physical Activity Epidemiology  1
SOC 751  Survey Methods for Social Research  3
SOC 752  Measurement and Questionnaires for Survey Research  3
STAT/B M I 652  Topics in Biostatistics for Epidemiology  1-3
STAT 349  Introduction to Time Series  3
STAT 351  Introductory Nonparametric Statistics  3
STAT 411  An Introduction to Sample Survey Theory and Methods  3
STAT 456  Applied Multivariate Analysis  3
STAT/COMP SCI 471  Introduction to Computational Statistics  3
STAT 575  Statistical Methods for Spatial Data  3
STAT/B M I 641  Statistical Methods for Clinical Trials  3
STAT/B M I 642  Statistical Methods for Epidemiology  3
STAT 761  Decision Trees for Multivariate Analysis  3
SOC 952  Seminar-Mathematical and Statistical Applications in Sociology (can be taken with approval for appropriate topics)  3
ED PSYCH 711  Current Topics in Educational Psychology  1-3
ED PSYCH 773  Factor Analysis, Multidimensional Scaling and Cluster Analysis  3
ED PSYCH 861  Statistical Analysis and Design in Educational Research  3
ED PSYCH 862  Multivariate Analysis  3
ED PSYCH 871  Test Theory II  3
ED PSYCH 960  Structural Equation Modeling  3
ED PSYCH/ELPA 964  Hierarchical Linear Modeling  3

POLICIES

GRADUATE SCHOOL POLICIES
The Graduate School’s Academic Policies and Procedures (https://grad.wisc.edu/acadpolicy) provide essential information regarding general university policies. Program authority to set degree policies beyond the minimum required by the Graduate School lies with the degree program faculty. Policies set by the academic degree program can be found below.

MAJOR-SPECIFIC POLICIES

GRADUATE PROGRAM HANDBOOK
The Graduate Program Handbook (https://pophealth.wisc.edu/grad/academicGuide) is the repository for all of the program’s policies and requirements.

PRIOR COURSEWORK

Graduate Work from Other Institutions
With program approval, students are allowed to count a maximum of 12 credits of graduate coursework taken from other institutions as a graduate student. Coursework earned five or more years prior to admission to a doctoral degree is not allowed to satisfy requirements.

UW–Madison Undergraduate
No credits from a UW–Madison undergraduate degree are allowed to count toward the degree.

UW–Madison University Special
With program approval, students are allowed to count no more than 12 credits of coursework numbered 300 or above taken as a UW–Madison University Special student. Coursework earned ten or more years prior to admission to a doctoral degree is not allowed to satisfy requirements.

PROBATION
A student not meeting guidelines for satisfactory progress will be placed on probation for one semester and will be reviewed by the Steering Committee following the probationary semester. Students may be dropped or allowed to continue by the committee based on review of progress during the probationary semester.

ADVISOR / COMMITTEE
All students will have a hold placed on their registration each semester. Students must meet with their advisor once each semester for academic advising to have the hold removed.
CREDITS PER TERM ALLOWED
15 credits

TIME CONSTRAINTS
Dissertation required. Doctoral students have a maximum of five years from the date of passing the preliminary examination to take the final oral examination and deposit the dissertation.

Doctoral degree students who have been absent for five or more consecutive years lose all credits that they have earned before their absence.

OTHER
While we can't guarantee funding for all enrolled students, we work in partnership with each student to find all suitable funding options.

PROFESSIONAL DEVELOPMENT

GRADUATE SCHOOL RESOURCES
Take advantage of the Graduate School's professional development resources (https://grad.wisc.edu/pd) to build skills, thrive academically, and launch your career.

LEARNING OUTCOMES

1. Articulate research problems, potentials, and limits with respect to theory, knowledge, and practice of Epidemiology based on understanding of its methodological, biostatistical, and biologic foundations.

2. Assemble, evaluate and synthesize evidence from literature and data sources to formulate ideas, concepts, designs, and/or techniques beyond the current boundaries of knowledge about causes, distribution, and prognosis of diseases and other factors related to health.

3. Demonstrate breadth and depth of knowledge of Epidemiology in a specific substantive area, such as, but not limited to, infectious diseases, genetics, sleep, chronic diseases, environmental, and social epidemiology.

4. Create research that makes a substantive contribution to the knowledge base of Epidemiology.

5. Develop mastery of scholarship in Epidemiology relevant to generate knowledge useful to inform research needs and public health and patient care policies

6. Communicate complex ideas both in writing and orally in a clear and understandable manner.

7. Recognize and apply principles of ethical and professional conduct in their scholarship.

PEOPLE

Faculty: Professors Durkin (interim chair), Cruickshanks, Gangnon, Kanarek, Palta, Patz, Remington, Trentham-Dietz; Associate Professors Astor, Bautista, Ehrenthal, Engleman, Gangnon, Peppard, Sethi; Assistant Professor Malecki