



**PROGRAM POLICY STATEMENT
DOCTOR OF PHILOSOPHY (PHD) IN EPIDEMIOLOGY**

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I. EXECUTIVE SUMMARY

Epidemiology is the study of the origin and causes of diseases in a community. It is frequently considered the basic science of public health, and its methods are used by epidemiologists, laboratory scientists, statisticians, physicians and other health care providers, and public health professionals to better understand the determinants of health and the distribution of those determinants in communities (Centers for Disease Control and Prevention (CDC n.d.). In general, the field of public health requires a dynamic and highly trained workforce, which is constantly challenged to meet the new demands on a local, state, national, and global scale. From increases in chronic disease morbidity and mortality in developing nations to antibiotic resistance and from emerging and reemerging infectious diseases and natural and man-made disasters, the public health workforce must be capable to respond by applying advanced scientific training to address these threats. Epidemiologists are an integral component of the public health workforce and are key to our public health system's capacity.

Shortages in graduate trained epidemiologists at all levels, including the PhD, have been documented across research and practice. Since 2001, the Council of State and Territorial Epidemiologists (CSTE) has conducted Epidemiology Capacity Assessments (ECAs) to monitor epidemiology capacity in the U.S. (CSTE 2017). According to the most recent assessment, an additional 1,200 epidemiologists are currently needed in the national public health workforce, an increase of 36% over current employment. Workforce needs are particularly acute in areas such as research, evaluation, and in emerging program areas including substance abuse, mental health, informatics, and data translation. An assessment of Federal public health, environmental, and agricultural laboratories' capacity found that only 12% of the workforce had a doctoral or professional degree (CDC 2013) and the National Association of County and City Health Officials (NACCHO) notes that only 20% of top health department executives have graduate training in public health (NACCHO 2008). In a CDC survey of academic health center Chief Executives, 94% reported faculty shortages were a problem in at least one of their health professional schools, with 55% specifically pointing to faculty shortages in schools of public health (Moskowitz 2007).

In addition to these public health workforce shortages, the Bureau of Labor Statistics (BLS) projects long-term employment growth for academic faculty in the health sciences, including public health and epidemiology, to be 19% between 2014 and 2024 (BLS 2014). The U.S. Department of Labor ranks post-secondary health specialties faculty 57 of 589 of the fastest growing occupations in the U.S. (Department of Labor 2017). A recent survey of nearly 12,000 graduates from doctoral-level programs in public health showed that individuals were trained in either epidemiology or biostatistics or from an academic institute with the highest level of research intensity were significantly more likely to secure employment in both academic and non-academic settings after graduation (Brown-Podgorski et al. 2018).

II: PROGRAM HISTORY

A. Statement of Purpose and Expectations of Graduate Study in Epidemiology

A.1. Statement of Purpose

Epidemiology is the study of the distribution and determinants of health-related states or events in populations and the application of this study to the control of health problems (Last, 2001). It is considered the basic science of public health and a core function of both public health research and practice (Haveman-Nies et al., 2011). Since the World Trade Center terrorist attack on September 11, 2001, and the subsequent anthrax attacks, public health has played a critical role in our national response to public health threats (Lurie, 2004). Recent natural disasters like Hurricanes Harvey, Irma, and Maria and emerging infectious disease threats like novel influenza A (H1N1) and Zika Virus have highlighted the need for additional capacity in the epidemiology workforce (Stier and Goodman 2007). A growing focus on the advanced use of population health data to develop interventions, measure change, and provide evidence for the optimization of health policies, service strategies and systems, and technologies also point to the need for more graduates trained at the PhD level in epidemiology (National Research Agenda for Public Health Services and Systems 2012).

The goal of the newly founded Epidemiology program at the University of Delaware is to provide students with the methodological and applied skills needed to address a broad range of health problems. These may include building the evidence base needed for linking public health data with clinical services and activities; developing scalable public health interventions, and supporting clinical services in ways that affect populations at large. The inherently interdisciplinary nature of public health means that this new program will bring in expertise from many different areas to create an academic environment of collaboration and innovation, creating a unique program to prepare doctoral students for careers in applied epidemiology in the university setting, as well as in governmental public health, and the for-profit and not-for-profit sectors (Bowen-Podgorski et al. 2018).

A.2. Expectations of Graduate Study in Epidemiology

This new program at the University of Delaware's College of Health Sciences will attract high-quality domestic and international doctoral students who will be interested in exploring applied areas of epidemiology, such as surveillance, field epidemiology, and disaster epidemiology. Students will also be interested in applying the methods of epidemiology to research in established programs in the College of Health Sciences, such as Physical Therapy (PT) or Kinesiology and Applied Physiology (KAPP) (See **Letters of Support**). The establishment of a PhD program in Epidemiology will accommodate students who need academic training beyond the master's level and address the well-documented national shortage of PhD-level epidemiologists. Many of the newest challenges we face – climate adaptation, reemerging diseases, and the need to engage communities in problem solving around improving health – will benefit from the application of epidemiologic methods in both the research and practice setting. The University of Delaware is an ideal institution to train such professionals because of the excellence of its programs and its emphasis on interdisciplinary research.

The PhD in epidemiology will enroll students beginning in Fall 2019 and will apply for accreditation as part of the Masters of Public Health (MPH) application. The MPH is the central degree around which public health accreditation, which is managed by the Council on Education for Public Health (CEPH), is based. Accreditation documents can be submitted following

graduation of the first student from the MPH in Epidemiology.

III: ADMISSION

A. Admission Criteria and Requirements

A1. Criteria

Applicants from diverse backgrounds who have a strong interest in epidemiology are encouraged to apply. Each application will be evaluated individually on the basis of three key areas:

- 1) Academic record/achievement;
- 2) Work, research, and/or community experience;
- 3) Commitment to, and, interest in working to improve the public's health.

A2. Requirements

Prior to application for CEPH accreditation, applicants will submit all materials directly to the University of Delaware's Office of Graduate and Professional Education using the online admission process (<https://grad-admissions.udel.edu/apply/>). Following the submission of an application for CEPH accreditation by the program, applicants will apply through SOPHAS (<http://sophas.org/>), a centralized application service used by all public health programs that are accredited (or seeking accreditation) from CEPH.

Students enrolled in the PhD in Epidemiology are expected to be full-time students as defined by the policies of the Office of Graduate and Professional Education. Students are encouraged to reach out to potential mentors before they apply to ensure a good fit with the program.

Admission and funding are a commitment on the part of the entire program to support the student's successful matriculation through the program. In the majority of cases, admission and funding decisions go hand in hand; in rare cases, students will be admitted without funding.

Admissions are determined based on a combination of previous grades, GRE scores, letters of recommendation, interview, personal statement, prior research and practical experiences, an appropriate match to an advisor, and available funding. Admission is based on a holistic evaluation of the student's profile, available funding, and identification of a willing mentor who is a good fit for the student's interests. While an appropriate advisor and willing mentor must be identified as part of this process, admission is competitive and meeting the minimum requirements does not guarantee admission nor does failure to meet all of these requirements necessarily constitute preclusion from admission if applicants offer other appropriate strengths.

A master's degree in public health or a closely related field (for example: epidemiology, environmental health or science, biostatistics, health administration, immunology, sociology, psychology, food science, animal science, toxicology, etc.) is recommended. Students without this background may be admitted but may be required to make up deficiencies by enrolling in appropriate courses, as determined by their advisor. For the purposes of measuring time to degree, those applying in an unrelated field may have up to 4 additional academic semesters to complete their degree, depending on their research focus.

Minimum admissions requirements include:

- The program requires that applicants have a minimum of 3.00 cumulative grade point average (GPA) in prior degrees, including bachelor's and typically also master's degree, from an accredited institution in public health or a related field.
- A verbal and quantitative GRE ($\geq 50^{\text{th}}$ percentile) within past 5 years.
- Consistent with University policy, a minimum of 100 on the Internet-based Test of English as a Foreign Language (TOEFL) or a score of at least 600 (paper based) is required for non-native English speakers who have completed prior degrees in non-English speaking institution (those with prior degrees from an accredited institution in the US, Canada, UK, Australia, and New Zealand are exempt).
- A primary advisor must be identified, a satisfactory interview with the advisor must be completed, and the advisor must be willing to mentor the applicant.
- Three letters of recommendation with satisfactory characterization of the applicant are required; two or more letters must address academic skills and research potential.
- All applications need to include a personal statement. In addition to discussing areas of interest, career goals, and how this program will help the applicant to reach goals, the following information should be included in the statement:
 - Research experience, when applicable: please indicate length and type of experience;
 - Practice experience, when applicable: please indicate the length and type of agency;
 - Advisor preference: please designate primary faculty advisor, and secondary advisors in order of preference.

To receive priority in admissions and funding decisions, applications must be completed by January 15 for the following fall (except Fall 2019; applications will be accepted after notification of approval from Faculty Senate). Applicants will typically be notified of acceptance in mid-March and will be expected to respond to the offer on or before April 15.

Admission to the graduate program is competitive. Those who meet stated requirements are not guaranteed admission, nor are those who fail to meet all of those requirements necessarily precluded from admission if they offer other appropriate strengths.

B. University of Delaware Diversity Statement

The University of Delaware's educational mission is to prepare students to live in an increasingly interconnected and diverse world. To do so, we are committed to fostering a robust educational environment that supports critical thinking, free inquiry, and an understanding of diverse views and values. We see diversity as a core value and guiding principle for our educational mission and thus must work to make diversity an integral part of everyday life on campus. To this end, we take diversity to mean both the recognition and appreciation of the different backgrounds, values, and ideas of those who comprise our campus, as well as a commitment to ensuring that all people on our campus are treated according to principles of fairness, civility, dignity, and equity. We are committed to building an educational community that understands people from different backgrounds and economic circumstances, with different needs, and from diverse

personal and philosophical beliefs. We want to make all people who are part of the University feel welcome and valued in campus life.

IV: ACADEMIC DEGREE: DOCTOR OF PHILOSOPHY (PHD) IN EPIDEMIOLOGY

Epidemiology is a broad, interdisciplinary field, which can be closely aligned with environmental health, disaster science, oral health, genomics, mental health, sociology, and pharmacy, as well as other disciplines. At the graduate level, Epidemiology programs do not typically offer concentrations, but rather promote an open environment for students to expand their knowledge in content areas of interest throughout their education and research. A MPH degree in Epidemiology is being submitted concurrently with this proposal.

The PhD in Epidemiology at the University of Delaware will however have a strong applied focus, preparing students to understand surveillance systems and how they can be applied to diseases of concern using new technologies and data linkages, to design and implement epidemiologic studies, and to collaborate across disciplines and professions to improve the health of communities and populations. Upon completion of the degree, students will be well-prepared to conduct epidemiological research in both the university and practice setting, where they may apply their academic training to defining public health practice and policy, investigating outbreaks, building capacity for risk assessments and surveillance, guiding interventions to improve population health, or evaluating programs and policies.

A. Degree Requirements

A1. Coursework and Credit Hours

The PhD program is envisioned for 3-5 years, for a total of 6-10 academic semesters, including fall and spring semesters. The PhD program is designed to be full time, following the graduate school policies about the relation between enrolled credit hours, student candidacy status, and funding. This is generally an enrollment of 6-9 semester hours or continuing registration following admission to candidacy. A maximum load is typically 12 graduate credit hours; however, additional credit hours may be taken with the approval of the student’s advisor and the Office of Graduate and Professional Education. Permission must be obtained from the Office of Graduate and Professional Education to carry an overload in any session.

A minimum of 54 credit hours is required. A maximum of 9 hours of graduate credits can be transferred in from another university to satisfy requirements for the Epidemiology PhD program. Course work completed while pursuing a prior bachelor’s or master’s degree does not apply to completion of the doctoral degree. The minimum requirements are summarized in Table 1.

Table 1. General requirements, PhD in Epidemiology

Course Category	Specific Requirements	Hours	Total Hours
Epidemiologic Methods			6

	Epidemiologic Methods Sequence	6
Statistics		15
	Advanced statistics courses	15
Relevant Coursework in Content Area		21
	Independent study w/ advisor	3
	Doctoral Seminar	3
	Content Courses	15
Grant Writing and Dissertation		12
	Pre-Candidacy Study / Grant Writing	3
	Dissertation	9
Total		54

Epidemiologic Methods: 6 credits, including Epidemiology Methods II and Epidemiology Methods III

Statistics: 15 credits, STAT 656 and 4 additional courses as appropriate, which may include STAT 609 (Regression & Experimental Design), STAT 611 (Regression), STAT617 (Multivariate Methods), STAT 666 (Special Topics), STAT 674 (Applied Database Management), and STAT 675 (Logistic Regression)

Relevant coursework in content area: A doctoral seminar aimed at coverage of research principles and ethics and professional development (3 credits); An independent study with the advisor, specific to the student and taken during the winter of the second year (3 credits); Courses in epidemiology content areas relevant to the student's interests (cardiovascular epidemiology, injury epidemiology, infectious disease epidemiology) 21 credits total. Other credits may include credits obtained outside the department. There is value in participating in formal seminars and classes as a group. With this in mind, a maximum of 6 credits for independent study registrations may count toward the degree.

Pre-candidacy study / Grant Writing course: 3 credits; a goal will be to complete a fundable federal application. Products should be submitted for funding if the student is eligible. This course will typically be taken just after the student's completion of his/her qualifying exam and should be linked to the development of the prospectus when possible.

Dissertation (see below for description): Variable credit, 1-9 semester hours. Students may enroll for dissertation credit following successful presentation and defense of the prospectus. The first semester of dissertation will carry 6-9 semester hours of dissertation credit. Subsequently, students may enroll for 1 credit of dissertation per semester, unless fellowship or funding rules require greater registrations.

Example of course of study shown below:

Table 2. Example course of study, PhD in Epidemiology

	Fall	Winter	Spring
Year 1	<u>Total 9 credits</u> Statistics (3) Content Courses (6)	<u>Variable credits</u>	<u>Total 9 credits</u> Statistics (3) Epi Methods II (3)

		(Possible spreading out of coursework from other semesters)	Content Course (3)
Year 2	<u>Total 9 credits</u> Statistics (3) Content Course (3) Epi Methods III (3)	<u>Total 3 credits</u> Independent study (3)	<u>Total 9 credits</u> Statistics (3) Content Course (3) Doctoral Seminar (3)
Year 3	<u>Total 6 credits</u> Grant Writing (3) Statistics (3)	<u>Variable credits</u> (Possible spreading out of coursework from other semesters)	<u>Total 9 credits</u> Dissertation (9)
Year 4	<u>Total 0-9 credits</u> Dissertation/continuing registration) (0-9 credits, the latter for candidates with fellowship as needed) *	<u>Total 0-9 credits</u> Dissertation/continuing registration) (0-9 credits, the latter for candidates with fellowship as needed)*	<u>Total 0-9 credits</u> Dissertation/continuing registration) (0-9 credits, the latter for candidates with fellowship as needed)*

* NOTE: If a student does not have funding, the student can enroll for 1 credit per semester for dissertation after initial dissertation enrollment.

A2. Qualifying Examinations

Students are eligible to take the qualifying exam upon completion of 39 credits. The qualifying exam is ordinarily taken before the start of the 5th academic semester (before fall of year 3) and must be passed before the start of the 7th academic semester (before fall of year 4), or the student is no longer eligible for continuation in the program. The dissertation committee serves as the qualifying examination committee in most cases. Committee substitutions and replacements should be approved by the Director of the Program in Epidemiology.

The qualifying exam will include three to five questions in areas designed to test the students' knowledge of their area(s) of specialization. The examination is organized and administered by the advisor, in consultation with the dissertation committee. The student, advisor, and committee will work together to identify coursework or develop a reading list that will prepare the student for the exam.

Following receipt of the questions, students will have two weeks to write responses and then faculty will have two weeks to respond. A 2-hr oral examination will follow and will explore and amplify the questions posed in the written exam. Following completion of written and oral examinations, the committee will determine the adjudication of pass, conditional pass, or fail, for the exam as a whole. Students who conditionally pass must work with their committee to remediate the deficits outlined and may do so immediately (i.e., there is no prescribed waiting period or remediation plan involving additional coursework). Students who fail the qualifying exam must work with their advisors to create a plan for improvement, which shall be submitted to their committee detailing their planned activities in the semester(s) following the exam. Students who fail must wait at least 1 full academic semester from the time of failing before rescheduling the exam (e.g., if taken in the summer following year 2, the earliest possible retake would be in the spring of year 3). Students must be enrolled full time during any period of remediation. Students may fail/pass conditionally once and after that the student must pass unconditionally or be recommended for dismissal from the program. Students must pass both the oral and the written exam to progress in the doctoral program.

A3. Prospectus / Candidacy

Upon passing their qualifying exam, students will enroll EPID 964: Pre-Candidacy Study / Grant Writing to develop their dissertation prospectus. The prospectus is ordinarily submitted for defense before the start of the 6th academic semester (before spring of year 3) and must be passed before the start of the 8th academic semester (before spring of year 4) or the student must withdraw from the program, barring exceptional circumstances considered and approved by the dissertation committee.

Each dissertation committee shall consist of not less than four and not more than six members. Substitutions and replacements should be approved by the Director of the Program in Epidemiology. At least two members shall represent the major field, one of who shall be the committee's chairperson. One member shall represent the area of minor study. At least two members shall be from within the Program in Epidemiology and at least one member shall be an external examiner chosen from a different academic unit or from outside the University. The chairperson shall have an established a record of publication and/or scholarship in the field of the dissertation and shall be a member of the tenure-track faculty of the University. Faculty who have retired or resigned from the University may chair committees of students whose work began under their direction prior to their retirement or departure from the University. An advisor who is not employed by the University of Delaware may serve as co-chair of the committee providing that the other co-chair meets the qualifications stated above.

The format of the prospectus document may vary from student to student, but ideally it will provide a clear outline of the student's understanding of the background and motivation for dissertation questions, the methodology and planned analyses to be undertaken for their dissertation and the rationale for these methods and planned analyses. Students are encouraged to engage in meetings with their committee seeking collaborative feedback on the document prior to circulation. Formatting that closely mimics formatting requirements for the final dissertation document, per University of Delaware policy, is encouraged.

In recognition that research plans often change substantially following a prospectus defense, IRB/IACUC approval should be obtained immediately upon successful defense of the prospectus. If pilot data are included in the prospectus, IRB/IACUC approval should be obtained in advance of that data being collected. Where IRB or IACUC approval is already obtained it shall be provided to the committee.

The prospectus defense will be scheduled after the major advisor and the majority of members of the dissertation committee have determined that a defense is appropriate. A final copy of the prospectus must be delivered to the members of the dissertation committee at least two weeks in advance of the proposal defense. The prospectus defense will typically be closed and attended only by the student and the committee. The candidate will present a summary of the proposed research and will then field questions from the committee for a maximum of 2 hours. After all questions have been fielded, the dissertation committee will meet to decide whether the proposal is accepted, rejected, or accepted with conditions. Results of the meeting will then be presented to the student. The student may not receive more than one dissenting vote from members of the committee to receive a passing grade. Dissertation committee members will sign the final copy of the approved proposal and the candidacy form. A signed copy of the approved dissertation proposal will be forwarded to the Director of the Program in Epidemiology. Students who fail the dissertation proposal defense will receive one additional opportunity to repeat the process and defend a new or modified dissertation proposal. Subsequent failure will constitute grounds for recommendation that the student be dismissed from the PhD program.

Upon the recommendation of the committee, students will be admitted to candidacy for the Ph.D. degree. Students are responsible for obtaining all the necessary signatures on the Doctoral Degree Candidacy Recommendation form. The stipulations for admission to doctoral candidacy are that the student has (1) had a program of study approved, (2) completed at least two academic years of fulltime graduate study in residence at the University, (3) passed the qualifying examination and (4) successfully defended their prospectus, along with having obtained IRB approval for their research, where applicable. The deadline for admission to candidacy for the fall semester is August 31. The deadline for admission to candidacy for the spring semester is January 31. The deadline for admission to candidacy for the summer is April 30. Responsibility for seeing that admission to candidacy is secured at the proper time rests with the student.

A4. Dissertation

In cases where substitutions are made on the dissertation committee after the successful defense of the proposal, the same rules governing the composition of the committee apply. Substitutions may be made with the approval of the Director of the Program in Epidemiology. The format of the dissertation must adhere to the University's Thesis and Dissertation Manual and style guidelines. The manual is available electronically on the Web at <http://www.udel.edu/gradoffice/forms/thesismanual.pdf>.

Prior to scheduling the defense, the student will file a memo certifying that the student has met all requirements and indicating the time and location of the defense has been agreed to by all committee members and the student. A copy of the dissertation must be available at least two weeks prior to the dissertation defense by either submitting an electronic copy to the

Epidemiology administrative staff for redistribution, or by delivering a hard copy to each faculty member on the committee. The dissertation defense will be scheduled only after the advisor and a majority of the dissertation committee has determined that a defense is appropriate, based on the written document. Lack of positive determination will lead to a recommendation to the student to revise the document according to comments, within the 10-semester limit for the program. A second submission failing to satisfy committee concerns will lead to the recommendation to the whole faculty that the student be dismissed from the PhD program.

The dissertation defense will be open and advertised to the public, and invitations will be sent to all Epidemiology faculty and students at least two weeks prior to the defense date. The candidate will present a summary of the completed research not to exceed 30 minutes, and will then field questions from the committee, attending faculty, and invited guests. After all questions have been fielded, the dissertation committee will meet to decide whether the dissertation is accepted, rejected, or accepted pending revisions. Results of the meeting will then be presented to the student. The student may not receive more than one dissenting vote from members of the committee to receive a passing grade.

Following a successful defense, students must follow the university approved step-by-step guidelines for graduation. The University reserves the right to duplicate a dissertation for distribution to other libraries or for the use of individual scholars. However, the University will not publish a dissertation for general distribution without the written consent of the author. If copyrighting of a dissertation is desired, it may be arranged when the dissertation is submitted to the Office of Graduate and Professional Education. Published works are eligible for copyright protection in the United States if the work is first published in the United States.

Failure to achieve a majority of dissertation committee member approval for the oral defense will lead to a written document to the student requiring defense failures. The student will then remediate and re-present the oral defense, within the accepted timeframe for the PhD program. A second failure in oral defense will lead to recommendation for dismissal from the PhD program.

A5. Residency

Given that a portion of the learning that occurs during a research doctorate comes from interactions with peers and participation in the on campus intellectual environment, the PhD program has a residency requirement of a minimum 2 years on site (minimum of 4 academic semesters). We prefer that these semesters be completed sequentially and early in the student's program but variances to that requirement may be made in particular circumstances.

Following UD policy, graduate students are required to maintain continuous registration each fall and spring semester to be eligible to continue in the Epidemiology graduate degree program. Failure to comply with the requirement of maintaining continuous registration in the fall and spring semesters either in courses, in sustaining credit, or with approved leave of absence will be taken as evidence that the student has terminated his/her graduate program, and the matriculated status to the graduate program will be terminated. The date of termination will be recorded on the student's record in the student record system.

A6. Research and Ethics Training

Students must meet NIH and NSF requirements for Responsible Conduct of Research Training, regardless of their funding source, via registered coursework and/or unregistered workshops. This training may not be completed exclusively via online training and should be completed in the first 2 years of the PhD program.

A7. Teaching Competence

Since many students will go on to be university level instructors, students are required to demonstrate some teaching preparation. This requirement may be completed at any time in the student's program. The teaching experiences will enable students to: (1) plan and present lectures, (2) participate in the evaluation of student performance, and (3) produce a teaching statement that can be used for faculty position applications. Students can meet the teaching competence requirement by serving as a teaching assistant for a course offered on campus. If students do not have the opportunity to serve as a teaching assistant, the following guidelines are recommended to develop teaching excellence: (1) prepare and present three lectures under the mentorship of a faculty member; (2) include a plan for the evaluation and grading of materials presented in the lectures; (3) turn in a finished teaching statement. Teaching experiences are required for all students regardless of whether they receive funding as a teaching assistant. Upon completion of the teaching experience, students should prepare a memo documenting their competence based on the guidelines described above (i.e., plan and present three lectures, develop an evaluation plan and grading rubric, and write a teaching statement). This memo will be submitted to the dissertation committee, who will sign off on the demonstration of teaching competence and submit the memo to the Office of Graduate and Professional Education for use at the time of degree audit.

A7. English Proficiency and Language Requirements

Because most aspects of the program will be conducted in English, all students, including native and non-native English speakers, are required to demonstrate sufficient oral and written English proficiency to meet the student's research and professional goals. Informal assessment will be made the dissertation committee, depending on time point in the program, and faculty as a whole more generally throughout the program. For non-native English speakers, basic proficiency will have been documented at the time of application via TOEFL scores. If deficiencies are nonetheless subsequently noted, the advisor will make recommendations to the student for remediation, and an action plan will be instituted. For students receiving funding for teaching at the University of Delaware, students must satisfy English requirements that may be established by the University for teaching (<http://sites.udel.edu/eli/programs/professionaltraining/ita/>). Failure to meet established requirements will constitute grounds for recommendation of dismissal from the program, by faculty vote. Ideally, such concerns should be noted and documented within the first year and resolved within the first two years of the PhD program.

A7. Documentation of Non-Registration Requirements

The dissertation committee are responsible for determining that the student has met both registered and non-registered requirements. Documentation is required to be submitted at the time the Qualifying Exams or the Thesis Defense are being scheduled.

Delay of courses until after the qualifying examination shall be approved by the dissertation committee and forwarded to the Director of the Program in Epidemiology. Reasons for delay might include variations in the timing of a particularly relevant course, overloads in a given semester, a need to accommodate scheduling conflicts, or in rare cases, personal reasons.

Following completion of the qualifying exam, the dissertation committee will be responsible for ensuring that requirements unmet prior to the qualifying exam are met before graduation. Any additional variations in procedure shall be approved by the dissertation committee and forwarded to the Director of the Program in Epidemiology. Given the program's commitment to student funding, significant variations that extend the student's time to degree or the time on funding should be approved by the entire faculty.

Progress benchmarks that require approval by the entire faculty if not met are:

- Registering for and writing the qualifying exam before the start of the fifth academic semester in the program.
- Defending a prospectus by the start of the sixth academic semester in the program
- Extending completion of the dissertation beyond the tenth academic semester in the program.

Typical reasons for variation might include a leave of absence for a significant illness, significant changes in caregiving responsibilities (birth, adoption, foster care, elder care, care for siblings or other family with significant needs), completing clinical requirements outside of funded assistantships, etc. Exceptions to any aspect of degree requirements must be explicitly approved by Director of the Program in Epidemiology and filed in the student's program folder.

B. Committee for Exams, Thesis, or Dissertations

B1. Initial Advisor Assignment

Students will be accepted into the PhD program only upon acceptance by a specific advisor and the satisfaction of other admission requirements (Section III). During the first year of the program, the advisor will meet with the student to explore specific directions that the student will pursue during the program. To request a change in advisor, the student or advisor shall request this change in writing to the Director of the Program in Epidemiology (or in the case of the director as advisor, to the whole faculty, who will then appoint a representative to serve in that role). The Director of the Program in Epidemiology (or a representative of the faculty) shall meet with the student and advisor and mediate the outcome so that it is suitable to all. Changing advisors can serve as a significant barrier to timely progress. If no suitable and willing mentor can be found within the program, the student may be counseled to leave the program.

B2. Identification of Prospectus / Dissertation Committee

With input from the advisor, the student will identify prospectus/dissertation committee members and approach these individuals for acceptance of this role. The prospectus committee serves as the dissertation committee in most cases. Each prospectus/dissertation committee shall consist of not less than four and not more than six members approved by a majority faculty vote.

Substitutions and replacements must be approved by the Director of the Program in Epidemiology. At least two members shall represent the major field, one of who shall be the committee's chairperson. One member shall represent the area of minor study. At least two members shall be from within the Epidemiology program and at least one member shall be an external examiner chosen from a different academic unit or from outside the University. The chairperson shall have established a record of publication and/or scholarship in the field of the dissertation/ execution position paper and shall be a member of the tenure-track faculty of the University. Faculty who have retired or resigned from the University may chair committees of students whose work began under their direction prior to their retirement or departure from the University. An adviser who is not employed by the University of Delaware may serve as co-chair of the committee providing that the other co-chair meets the conditions stated above.

In general, the student and advisor will determine, jointly, the appropriateness of a change in prospectus/dissertation committee member. If a committee member does not agree with removal from the committee, the Director of the Program in Epidemiology will mediate the decision. Reconstituting the committee in a substantive way may extend the student's time to degree and change the progress benchmarks. It does not, however, commit the program to funding the student for additional time beyond that which was initially provided.

B3. Deadlines, Preparation Requirements, and Grading

What is often considered the comprehensive exam in other programs is distributed across the qualifying exam and prospectus in the Epidemiology PhD program.

Students are eligible to take the qualifying exam upon completion of 39 credits. The qualifying exam is ordinarily taken before the start of the 5th academic semester (before fall of year 3) and must be passed before the start of the 7th academic semester (before fall of year 4), or the student is no longer eligible for continuation in the program.

Upon passing their qualifying exam, students will enroll EPID 964: Pre-Candidacy Study / Grant Writing to develop their dissertation prospectus. The prospectus is ordinarily submitted for defense before the start of the 6th academic semester (before spring of year 3) and must be passed before the start of the 8th academic semester (before spring of year 4) or the student must withdraw from the program, barring exceptional circumstances considered and approved by the prospectus/dissertation committee.

Students may enroll for dissertation credit following successful presentation and defense of the prospectus. The dissertation should be approved by all members of the dissertation committee and the Director of the Program in Epidemiology no later than the end of the 10th academic semester.

Variances to deadlines are approved by the dissertation committee. Typical reasons for extensions/variances: Parental leave, extended caregiving, extended illness, completing a Fellowship.

C. Timetable and Definition of Satisfactory Progress

C1. Time Limit for Completing the Degree

The time limit for completion of the PhD degree begins with the date of matriculation and is specifically detailed in the student's letter of admission. Full-time students entering the PhD Program are given 10 consecutive semesters to complete the requirements. An extension may be granted for extenuating circumstances. Requests for time extensions must be made in writing and approved by the Director of the Epidemiology Program. The Program Director will forward the request to the Office of Graduate and Professional Education.

C2. Grade Requirements for Satisfactory Progress

All grade requirements are consistent with those of the University. To be considered in good academic standing, a student must maintain a minimum cumulative graduate grade point average (GPA) of 3.00 on a 4.00 scale each semester. To be eligible for an advanced degree, a student's cumulative grade point average shall be at least a 3.00 and the student's grades in courses counted toward the degree requirements of the program shall equal at least a 3.00.

Proficiency in spoken and written English is expected because most aspects of the program will be conducted in English. This proficiency should have been documented at the time of application via the TOEFL. Students with funding through TA positions must meet UD's requirements for English proficiency <http://sites.udel.edu/eli/programs/professionaltraining/ita/>.

The Epidemiology Program will follow the procedures for dismissal that are detailed in the University Catalog. Briefly, the prospectus or dissertation committee will report its recommendation and reason for dismissal to the Director of the Program in Epidemiology. The Chair will make a recommendation to the Office of Graduate & Professional Education, who will decide whether to dismiss the student. The student may appeal this decision to the Office of Graduate & Professional Education, following the procedure given in the University Catalog.

D. Forms Required

Where possible, University forms will be used (<http://grad.udel.edu/forms/>). If necessary, templates will be developed specific to the program.

V. ASSESSMENT PLAN

Program success will be evaluated in three ways: (1) quality of applicants recruited and timely completion of the degree, (2) students' learning outcomes, and (3) post-graduation surveys. Each year, the number of applicants and their credentials will be tabulated. In addition, information on number of students meeting key timelines will be assessed. The program will

also assess the extent to which the students are meeting the CEPH accreditation foundational competencies through: a) students' advanced knowledge in their particular area of study, b) students' statistical knowledge required for their particular sub-area, c) students' scholarly contribution, and d) student's independent research, classroom pedagogy. In addition, a formal survey will be sent to graduates 1, 3, 5, and 7 years after their graduation, to inquire about their present employment, publication record, funding history and satisfaction with their PhD training. Results of all of these findings will be regularly discussed among the faculty and submitted to relevant bodies.

VI. FINANCIAL AID

In the majority of cases, students who are admitted will receive funding commitments. Students receive a 100% tuition scholarship for classes taken during the fall, winter, and spring semesters and receive a nine-month stipend in exchange for 20 hours of instructional or research activities per week during those semesters. This program is committed to guaranteeing funding to students for the first 3 years, provided they appear to make adequate progress and receive adequate evaluations from funding supervisors. Students may petition for a funding for years 4-5. Such petitions will typically be granted if funding is available, the student is making good progress, and has been successful in prior assistantship placements.

Funding in the first two years typically comes from individual faculty grants and from funds within the program and college and may be characterized in 3 ways: Teaching assistants, graduate assistants, and research assistants. In some cases, students may be funded through faculty start-up funds. In years 3-5 students are expected to apply for funding, as they are eligible. This funding may replace program funding if the award is sufficiently large to cover stipend and/or tuition (e.g., UD graduate school fellowships, NIH F31s, NSF dissertation grants). Students appointed to assistantships are provided experiences that are gained by performing instructional or research activities that are compensated based on the University's guidelines of 20 hours per week in an assigned position. Every effort is made to match a student's skills to funder's needs as quickly as possible and in a way that respects student-training needs and existing skills. For international students, government requirements for work and compensation will be followed, as guided and mediated by the Office of International Students.

Students can also apply for internal funding. For example, students can apply for any of the competitive awards offered through the University of Delaware's Research and Graduate Studies Office. This includes the University Graduate Scholar Award.

Students are encouraged to participate in the American Public Health Association, the American College of Epidemiology, the Society for Epidemiologic Research, the International Association for Environmental Epidemiology, and other professional organizations at their discretion and advisor's suggestion. These professional associations frequently provide student travel and conference registration stipends. Program or other funding will be provided to present at these meetings when available, but is not guaranteed.

VII. PROGRAM ADMINISTRATION AND ORGANIZATION

A. Program Faculty

As the PhD Program is launched, it will be supported by current faculty from across the College of Health Sciences as well as faculty hired in the new Program in Epidemiology. **Appendix I** provides a list of potential affiliated faculty with research and teaching expertise relevant to epidemiology. **Appendix II** provides a list of current courses with relevance to public health or epidemiology.

B. New Courses Submitted

EPID610 Epidemiology Methods 2

Academic year 2019-2020

3 credit hours

An intensive introduction to epidemiological concepts and methods for students in the epidemiology concentration and others who will collaborate in – or be required to – interpret the results of epidemiological studies. Emphasis is placed on calculation and interpretation of crude and adjusted data, measures of association, and study design.

College: Health Sciences

Department: Epidemiology

Prerequisites: Introduction to Epidemiology (EPID 605)

EPID 615 Epidemiology Methods 3

Academic year 2019-2020

3 credit hours

In-depth treatment of key methodological and analytic topics in epidemiology. Emphasis on study design and implications for data analysis, such as confounding, model selection and effect modification. Analytic techniques using logistic regression and stratified analysis will be emphasized.

College: Health Sciences

Department: Epidemiology

Prerequisites: Introduction to Epidemiology (EPID 605) and Epidemiology Methods 2 (EPID 610)

EPID620 Infectious Disease Epidemiology

Academic year 2019-2020

3 credit hours

Principles and practices of epidemiology appropriate for the study of communicable diseases. Course focuses on methodology, public health concerns, patterns of transmission, and emerging and reemerging infectious diseases.

College: Health Sciences

Department: Epidemiology

Prerequisites: None

EPID621 Methods in Field Epidemiology

Academic year 2019-2020

3 credit hours

Introduction to methods used by field epidemiologists; conduct outbreak investigations from start to finish; study design; questionnaire development; interviewing techniques; data analysis; and communications of findings appropriate to various audiences.

College: Health Sciences

Department: Epidemiology

Prerequisites: None

EPID622 Disaster Epidemiology

Academic year 2019-2020

3 credit hours

Basic principles, terms, and epidemiological tools for use in disasters. Topics to be covered include: 1) public health consequences associated with various types of disasters; 2) rapid health assessment of disaster-affected populations; 3) establishment of emergency surveillance systems in disaster settings; 4) the federal and state disaster response framework; 5) selected case studies of disasters and their effects on populations; and 6) topics related to disasters in international health settings.

College: Health Sciences

Department: Epidemiology

Prerequisites: None

EPID623 Surveillance in Epidemiology

Academic year 2019-2020

3 credit hours

This course provides the conceptual foundations and practical skills for designing and implementing surveillance systems, for using surveillance data for research, and for conducting evaluations of public health programs.

College: Health Sciences

Department: Epidemiology

Prerequisites: None

EPID 650 Advanced Seminar in Epidemiology

Academic year 2019-2020

3 credit hours

Semester long readings course; topic will vary with instructor. Topics of research ethics and professional development will be included. Limited to doctoral students and postdocs.

College: Health Sciences

Department: Epidemiology

Prerequisites: None

EPID 860 Independent Doctoral Study in Epidemiology

Academic year 2019-2020

1-6 credit hours

Semester long study on any topic; topic will vary with instructor. Independent study may include readings or lab rotations and must result in a completed product (abstract or paper for peer-

review). May be repeated for credit with permission of the instructor due to the variability of the topic.

College: Health Sciences

Department: Epidemiology

Prerequisites: None

EPID 964 Pre-candidacy study / Grant Writing

Academic year 2019-2020

3 credit hours

This registration may be used for students preparing for their prospectus or qualifying exams; most commonly for prospectus preparation. The prospectus is prepared as a fundable grant application and will be submitted if competitive.

College: Health Sciences

Department: Epidemiology

Prerequisites: None

EPID 969 Dissertation

Academic year 2019-2020

1-9 credit hours

Students may enroll for dissertation credit after qualifying for candidacy.

College: Health Sciences

Department: Epidemiology

Prerequisites: Completion of all requirements for candidacy

Epidemiology Methods 2 and epidemiology content courses (EPID 620, EPID 621, EPID 622, EPID 623) are also included in the MPH in Epidemiology Program Policy Statement.

Appendix I. Potential Affiliated Faculty for Epidemiology PhD

Name	College	Department
Susan Conaty-Buck	CHS	NURS
Bethany Hall-Long	CHS	NURS
Emily Hauenstein	CHS	NURS
Amy Johnson	CHS	NURS
Rita Landgraf	CHS	BHAN
Laura Lessard	CHS	BHAN
Michael Mackenzie	CHS	BHAN
Beth Orsega-Smith	CHS	BHAN
Carly Pacanowski	CHS	BHAN
Freda Patterson	CHS	BHAN
Shannon Robson	CHS	BHAN
William Rose	CHS	KAAP
Laurie Ruggiero	CHS	BHAN
Kelebogile Setiloane	CHS	BHAN
Richard Suminski	CHS	BHAN
David Tulsy	CHS	PT

Appendix II. Existing Courses Relevant to Epidemiology PhD

The PhD degree includes flexibility for a student to select advanced statistics and other relevant content courses. Course from some relevant areas are listed below as a sample (**Table A1**). This list is not meant to be exhaustive and the courses taken must be selected in consultation with the advisor. This list includes the course number, title, and typical semesters in which the course is offered. The typical semester the course is offered is subject to change.

Table A1. Potential Courses

Course ID and Number	Department / College	Semester Offered	Course Description
BHAN609	Behavioral Health and Nutrition/ Health Sciences	Fall	Emphasis on procedures for designing survey-based research studies, including choice of subjects, development of proper instrumentation, statistical design and analysis, and formulation of proposals appropriate for publication
DISA650	Public Policy and Administration/ Arts and Sciences	Fall	Overview of disaster science and management including an historical overview of disasters. Required for all students entering the MS program in Disaster Science and Management. Topics include anatomy of a disaster, government, non government and private sector actors, and policy and regulation
GEOG622	Geography/ Earth, Ocean and Environment	Spring	Focuses on food, resources, energy and population issues in relationship to economic development and the global environment. Engages students in discussion and debate on sustainable development policies
GEOG630	Geography/ Earth, Ocean and Environment	Spring	Examination of the historical and contemporary factors shaping the global food system. Studying processes and practices-such as production and consumption, policymaking, activism, commodity exchange-as well as, actors including states, producers and consumers, farmworkers, farmers and policymakers. Consider how production and consumption are framed and discuss the spatial organization of access to food and agricultural resources through digging into issues related to food justice and food sovereignty on local and global scales
GEOG670	Geography/ Earth, Ocean and Environment	Spring, Fall	Introduces the principles and concepts of geographic information science to effectively use a professional level geographic information system. Practical

			hands-on exposure to "real" data and GIS software and hardware is provided through exercises and a final project
GEOG671	Geography/ Earth, Ocean and Environment	Spring	Advanced study of geographic information science and systems (GIS) including more complex spatial data models, editing and topology, data encoding, data quality, preprocessing techniques, spatial analysis, and cartography and visualization techniques. Hands-on experience using commercial and/or open source GIS package
HLTH844	Nursing/ Health Sciences	Spring, Fall	Integrates knowledge of healthcare information technology and public health data to support and facilitate individual and population health management and improvement. Focuses on the analysis and application of information technologies that support the provision of care including social context, availability of technology, and structure of information along with legal, regulatory, and ethical concerns. Emerging technologies and contemporary issues are highlighted
HLPR605	Behavioral Health and Nutrition/ Health Sciences	Fall	Focuses on selected aspects of the most common disease processes, symptom management, pharmacology and the impact of chronic conditions on the quality of life of clients and their families
HLPR610	Behavioral Science and Nutrition/ Health Sciences	Winter	Explores the relationships between health behavior and cognition, and media communications and messages. Specific attention placed on culturally influenced health outcomes, channels of communication, and personal and demographic influences. Health promotion programmatic considerations and interventions related to media factors will be emphasized
HLPR630	Behavioral Health and Nutrition/ Health Sciences	Fall	Emphasis on skills to assist individuals in making health behavior changes including weight management, physical activity, medication compliance, smoking cessation, and stress management. Students will develop plans and courses of action to assist individuals in making health behavior changes

HLPR632	Behavioral Health and Nutrition/ Health Sciences	Fall	An overview of the descriptive and inferential statistics needed to analyze and interpret health data and evaluate health-related literature in the core disciplines of public health including: epidemiology, biomedical science, social and behavioral science, health policy and management, and environmental health
HLPR803	Behavioral Health and Nutrition/ Health Sciences	Fall	Prepares skills for planning, developing, and implementing health promotion programs in a variety of settings and populations. Emphasis on the behavioral, epidemiological and socio-ecological issues that impact programming
HLPR807	Behavioral Health and Nutrition/ Health Sciences	Spring	Seminar format and multidisciplinary approach to study current issues. Different faculty review issues from the viewpoint of their disciplines. Students participate in the selection of topics and are required to prepare and present in-depth reports on multiple issues
HLPR823	Behavioral Health and Nutrition/ Health Sciences	Spring	Provides an overview of current models and theories of stress, a review of multidisciplinary approaches to the study of stress in applied settings, and a reading knowledge of selected research findings in the field of stress
KAAP601	Kinesiology and Applied Physiology/ Health Sciences	Spring	Emphasis on procedures for designing experimental research studies including choice of subjects, group design, choice of proper instrumentation, statistical design, formulation of experimental group programs and technical writing for proposals and publication
KAAP602	Kinesiology and Applied Physiology/ Health Sciences	Fall	Overview of statistical practice in health sciences research, particularly experimental research. Topics include experimental design, regression, analysis of variance including repeated measures designs and nonparametric tests
KAAP609	Kinesiology and Applied Physiology/ Health Sciences	Spring	In addition to addressing the current controversies surrounding concussions, this course will provide foundation knowledge in concussion pathophysiology, epidemiology, clinical and experimental assessment techniques, post-injury, cognitive and postural deficits, imaging approaches, and cumulative effects and later life neuropathological complications.
NURS881	Nursing/ Health Sciences	Fall	Provides an overview of the theoretical and scientific foundations of the clinical prevention and population health

			(CPPH) framework for delivery of health care. Concepts and methods of epidemiology, demography, disease prevention, genetics, genomics and epigenetics as they relate to population-based practice are addressed. Social determinants of health will be examined within the context of care delivery for individuals and aggregates/clinical populations
STAT608	Applied Economics and Statistics/ Agriculture and Nat Resources	Spring	An introductory statistics course for advanced undergraduate and graduate students with applications for life sciences, business, health, engineering, and the social sciences.
STAT609	Applied Economics and Statistics/ Agriculture and Nat Resources	Spring	Introduction and overview of inferential methods used in analyzing regression models and linear models for experimental designs
STAT611	Applied Economics and Statistics/ Agriculture and Nat Resources	Fall, Summer, Spring	Simple linear and nonlinear regression. Subset regression; principal component and ridge regression. Introduction to experimental design and design models
STAT617	Applied Economics and Statistics/ Agriculture and Nat Resources	Fall	Multivariate analysis of variance and covariance; classification and discrimination; canonical correlation; principal components; factor analysis
STAT674	Applied Economics and Statistics/ Agriculture and Nat Resources	Fall	Provides an in-depth understanding of using computers to manage data using programs such as SAS and Microsoft/Access
STAT675	Applied Economics and Statistics/ Agriculture and Nat Resources		Practical and computational introduction to logistic regression and related topics. Applications include financial, marketing and biomedical research. The use of SAS and other statistical packages will be emphasized
UAPP619	Public Policy and Administration/ Arts and Sciences	Fall	Focus on the "cutting edge" issues of urban affairs, public policy and public administration. Features presentations by leading policy makers, policy researchers, practitioners and scholars with whom students engage in lively discussion. Demonstrates the roles that public administration, policy analysis

			and policy research play in a complex global society
UAPP701	Public Policy and Administration/ Arts and Sciences	Spring	This course examines the political economy of public policy, including the intersection of policy with politics and markets, and the institutional and structural dimensions of the policymaking process. The course also explores the challenges of policy implementation, and modes of policy assessment and choice