THE GEORGE WASHINGTON UNIVERSITY
SCHOOL OF PUBLIC HEALTH AND HEALTH SERVICES

Columbian College of Arts and Sciences
and
School of Public Health and Health Services

PhD – Epidemiology (Plan B)*
2012-2013

Note: All curriculum revisions will be updated immediately on the website http://www.gwumc.edu/sphhs

Application Due Date: December 1, 2012

Program Director
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The purpose of the PhD program is to prepare students for a career in epidemiologic research in an academic or industry setting. The PhD graduate is expected to have knowledge across a wider range of epidemiologic theories and methods and specific knowledge of the epidemiology of one of the following areas: chronic disease, infectious disease, environmental and occupational health.

Doctoral student are required to pass a written comprehensive examination and to 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 using advanced analytic methods.

In addition to MS and MPH competencies, doctoral students in epidemiology must demonstrate competencies in the following areas: demonstrate understanding of general and specialized advanced epidemiologic concepts, develop a research protocol, conduct and analyze a research study, and disseminate research findings.

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

Demonstrate understanding of general and specialized epidemiologic concepts: Demonstrate knowledge of advanced epidemiologic concepts with specialized knowledge in a specific area of epidemiology (e.g., methods, infectious diseases, chronic diseases, environmental, or occupational); apply knowledge of disease pathogenesis to a study protocol; discuss major public health problems; and exhibit knowledge of ethical issues in research.

Develop a research protocol: Synthesize, identify gaps and/or limitations of published research and present appropriate hypotheses to address gaps; develop a research protocol including identification of data sources, evaluate appropriate instruments for data collection, the advantages and disadvantages of different epidemiologic study designs and sources of potential bias.

Conducting and analyzing data from a research study: Demonstrate proficiency in data collection, data cleaning, primary or secondary data analysis, summarizing statistical analyses and results, and evaluating potential for bias.

Dissemination of research findings: Provide a structured proposal of a research study including the background, study hypotheses, design, methodology, and contribution to the field; communicate dissertation results to lay and scientific communities through presentations at conferences and publications in the peer-reviewed literature.

Admissions Requirements
Applicants must hold an undergraduate degree from an accredited institution of higher learning. Applicants should have academic backgrounds of excellence, usually with majors, or equivalent, in the fields in which they intend to study for advanced degrees. Normally, a B average (or equivalent) from an accredited college is required. With evidence of special

* Students matriculating Fall 2009 or later may choose either curriculum Plan A or curriculum Plan B for the PhD in Epidemiology.

promise, such as high Graduate Record Examination scores, an applicant whose academic record falls short of a B average may be accepted on a conditional basis. Meeting the minimum requirements does not assure acceptance. The departments may, and often do, set higher admission standards. Moreover, the number of spaces available for new graduate students limits the number who can be accepted. Students who apply in their senior year must provide evidence of the completion of their baccalaureate work before registration in Columbian College is permitted. Applicants should be aware that graduate courses taken prior to admission while in non-degree status are not used in assessing admissibility to degree programs and may not be transferable into those programs. The Program-at-a-Glance presents the Ph.D. curriculum for students admitted to the Ph.D. program with no intermediate Master's degree.

If desired, a student may complete the M.S. or M.P.H. program prior to admission to the Ph.D. degree program, in which case no more than 24 credit hours from the M.S. degree may be applied to the Ph.D. course work requirements. In this instance the student will be required to take a minimum of 27 additional credit hours of coursework. The distribution of these courses between statistics and public health would depend on the nature of the Master's degree and whether the transferred credit hours would be used to defray statistics or public health course work. All applications are submitted to Columbian College Graduate School of Arts and Sciences. Full information about the Graduate Admissions Application and policies are available online at http://www.gwu.edu/apply/graduateprofessional. For reporting GRE general test scores use the following institutional code: 5246.

Minimum Prerequisite Courses for Admission Consideration (or equivalents to these GW courses)
The courses listed below (or equivalents) are prerequisites for admission consideration, and **MUST** appear on your transcript. Submit your PhD Epidemiology program admission application only after you have completed all of the following courses:

BISC (011)	1111	Introductory Biology: Cells and Molecules	4	Lecture (3 hours), laboratory (1 credit/3 hours). Nutrition and metabolism, cellular and developmental biology, genetics, and molecular biology of plants and animals.
BISC (012)	1112	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 plants, animals, fungi, and microorganisms; ecology and behavior; and animal structure and function.
MATH (031)	1231	Single-Variable Calculus I	3	Limits and continuity. Differentiation and integration of algebraic and trigonometric functions with applications.
MATH (032)	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

Additional Course Requirements
The courses listed below are "Additional Course Requirements." Applicants lacking these courses (or equivalents to these GW courses) will be considered for admission, but, if admissible, will be admitted conditionally with the expectation that these courses will be satisfactorily completed within two semesters following matriculation in the program. These credits do not count as credit toward the 72 credit graduation requirement, nor are grades earned in these additional courses reflected in the overall grade point average.

MATH (084)	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 (183) or PubH (249)	2183 6249	Intermediate Statistical Laboratory: Statistical Computing Packages Use of Statistical Packages: Data Management and Data Analysis	3 or 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. 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.

Ph.D. Epidemiology Degree Requirements

Course Distribution Summary	Credits
Core Courses • Public Health (18 Credits) • Statistics (12 Credits)	30
Approved Elective Courses • Public Health • Statistics	18 (minimum)
Consulting Note: May be waived by the Epidemiology Program Director, based on written documentation of prior equivalent course work or relevant work experience. Waiving part or all of this requirement does not alter the 72 total credit requirement. Waiver of the consultin course increases the total number of electives by the number of consulting credits waived.	3
Dissertation Research	12-21
Total Credits	72

The General Examinations

Part I is a written comprehensive examination consisting of one examination in the field of biostatistics and one in the field of epidemiology. The epidemiology examination is based on the course content of PubH 6247 Design of Health Studies, PubH 6252 Advanced Epidemiological Methods, and PubH 8419 Measurement in Public Health and Health Services Research as well as the biostatistics examination is based on the course content of PubH 8366 Biostatistical Methods and is administered by the faculty of the Department of Epidemiology & Biostatistics. Students are expected to take the comprehensive examination within 24 months from the date of enrollment in the program. In addition, students are required to make up any deficiencies prior to taking the examination, e.g., by enrolling in appropriate master's-level courses as needed. The doctoral comprehensive examination is administered once per year in late August. A student who fails to pass the comprehensive examination may, with the approval of the faculty, repeat all or portions of the examination. Failure on the second attempt will result in termination from the Ph.D. program.

Part II, the research proposal, consists of an oral examination based on a written dissertation research proposal. As soon as feasible after successful completion of the comprehensive exam, students are encouraged to identify a dissertation advisor and a topic of research. The written dissertation proposal is then submitted to the student's Dissertation Research Committee, and the student will make an oral presentation of his or her proposal to the Committee. The Committee will determine the student's readiness to pursue and successfully complete the proposed research, in addition to the appropriateness of the specific problem for dissertation level research.

Upon successful completion of the required course work and both parts of the General Examination, the candidate will generally be recommended to the Associate Dean for Graduate Affairs of The Columbian College of Arts and Sciences (CCAS) for promotion to PhD **Candidacy:** the dissertation research. A candidate must file an approved dissertation research plan with the CCAS before being admitted to PhD Candidacy. Prior to completion of the General Examination, a student may register for at most 6 credit hours of Dissertation Research (EPID 8999).

The document Doctoral Dissertation Reference Guide describes the specific requirements for the doctoral dissertation established by the ***Program Management Committee***.

Professional Enhancement Requirement (Two Days)

Professional enhancement activities supplement the academic curriculum and help prepare students to participate actively in the professional community. They enhance practical knowledge and awareness of public health issues – either in general or in a student's specific area of study.

Students can fulfill this requirement by attending workshops, seminars, or other relevant professional meetings, which are often held at SPHHS and in the metropolitan Washington, DC area. Examples of conference sponsors include the National Academy for State Health Policy, the Pan American Health Organization, the American Public Health Association, the American College of Healthcare Executives, the Area Health Education Center, the American College of Sports Medicine, and the National Athletic Trainer's Association. Opportunities for professional enhancement are regularly publicized via the SPHHS Listserv and through your department or advisor. It is hoped that PhD students will fulfill one day of this two day requirement by participating in a poster presentation at GWUMC Research Day.

Students must submit documentation of Professional Enhancement activities to the Epidemiology Program Director, which includes a prior approval, a description of the program agenda, and proof of attendance before applying for graduation.

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Program-at-a-Glance
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Required Core Courses (30 Total Credits)				
Required Public Health Core Courses (15 Credits)		**Credits**	**Semester Offered**	**Grade**
PubH 6001 (201)	Biological Concepts for Public Health	2	Summer 1, Fall, Spring	
PubH 6003 (203)	Principles and Practice of Epidemiology	3	Fall, Spring, Summer 10 week	
PubH 6247 (247)	Design of Health Studies *Basis for PhD General Comprehensive*	3	Fall, Spring	
PubH 6252 (252)	Advanced Epidemiologic Methods *Basis for PhD General Comprehensive*	3	Fall,Spring	
PubH 8419 (403)	Measurement in Public Health and Health Services *Basis for PhD General Comprehensive*	3	Spring	
PubH 6299 (209)	Topics	2	Summer, Fall, Spring	
	One of the following:			
PubH 6004 (204)	Environmental & Occupational Health in a Sustainable World	2	Summer 1, Fall, Spring	
PubH 6005 (205)	Policy Approaches to Public Health	2	Sum 10 wk, Fall, Spr	
PubH 6007 (207)	Social & Behavioral Approaches to Public Health	2	Summer 1, Fall, Spring	
Required Statistics Core Courses (12 Credits)		**Credits**	**Semester Offered**	**Grade**
PubH 8364 (464)	Quantitative Methods	3	Spring	
STAT 6210 (210)	Data Analysis	3	Spring	
PubH 8365 (465)	Design of Medical Studies	3	Spring	
PubH 8366 (466)	Biostatistical Methods *Basis for PhD General Comprehensive*	3	Fall	
Approved Elective Courses (18 Credits Minimum)				
Approved Public Health Elective Courses ***** May be taken for 3 credits by adding PubH 209 Topics by the same name for 1 credit.		**Credits**	**Semester Offered**	**Grade**
PubH 6299 (209)	Topics in Epidemiology and Biostatistics	1-2	Summer, Fall, Spring	
PubH 6223 (223)	Toxicology: Applications for Public Health Policy	3	Spring	
PubH 6224 (224)	Problem Solving in Environ & Occup Health	3	Summer 10 week	
PubH 6242* (242)	Clinical Epidemiology and Decision Analysis	2	Spring	
PubH 6244* (244)	Cancer Epidemiology	2	Spring	
PubH 6245* (245)	Infectious Disease Epidemiology	2	Spring	
PubH 6246* (246)	Injury Epidemiology and Prevention	2	Spring	

PubH 6248* (248)	Epidemiologic Methods in Older Populations	2	Fall	
PubH 6250* (250)	Epidemiology of HIV/AIDS	2	Fall	
PubH 6252 (252)	Advanced Epidemiologic Methods	3	Fall, Spring	
PubH 6259 (259)	Epidemiologic Surveillance in Public Health	2	Spring	
Approved Statistics Elective Courses		**Credits**	**Semester Offered**	**Grade**
STAT 6227 (227)	Survival Analysis	3	Fall	
STAT 6231 (231)	Categorical Data Analysis	3	Fall Alternate Years	
STAT 6207 (207)	Methods of Statistical Computing I	3		
STAT 6208 (208)	Methods of Statistical Computing II	3		
STAT 6213 (213)	Intermediate Probability and Stochastic Processes	3	Spring, alternate years	
STAT 6215 (215)	Applied Multivariate Analysis I	3	Alternate academic yrs	
STAT 6216 (216)	Applied Multivariate Analysis II	3	Alternate academic yrs	
STAT 6217 (217)	Design of Experiments	3	Fall, alternate years	
STAT 6218 (218)	Linear Models	3	Spring, alternate years	
STAT 6223 (223)	Bayesian Statistics (Theory and Applications)	3	Spring, alternate years	
STAT 8226 (226)	Advanced Biostatistical Methods	3	Spring	
STAT 8262 (262)	Nonparametric Inference	3		
STAT 8263 (263)	Advanced Statistical Theory I	3	Fall	
STAT 8265 (265)	Multivariate Analysis	3	Fall, alternate years	
STAT 8273 (273)	Stochastic Processes I	3	Alternate academic years	
STAT 8274 (274)	Stochastic Processes II	3	Alternate academic years	
Consulting (3 Credits) Note: May be waived by the Epidemiology Program Director, based on written documentation of prior equivalent course work or relevant work experience. Waiver of the consulting course increases the total number of electives by the number of consulting credits waived.				
PubH 6299.58	Consulting Practicum	2	Summer, Fall, Spring	
PubH 6258 (258)	Advanced Topics in Biostatistical Consulting	1	Spring	
Dissertation Research (12-21 Credits)				
EPID 8999 (399)	Dissertation Research for PhD Epidemiology Students	Taken in units of 3 credits	Summer, Fall, Spring	