

2.11 ACADEMIC DEGREES. IF THE SCHOOL ALSO OFFERS CURRICULA FOR GRADUATE ACADEMIC DEGREES, STUDENTS PURSUING THEM SHALL OBTAIN A BROAD INTRODUCTION TO PUBLIC HEALTH, AS WELL AS AN UNDERSTANDING ABOUT HOW THEIR DISCIPLINE-BASED SPECIALIZATION CONTRIBUTES TO ACHIEVING THE GOALS OF PUBLIC HEALTH.

2.11.a Identification of all academic degree programs, by degree and area of specialization. The instructional matrix in Criterion 2.1.a may be referenced for this purpose.

See Instructional Matrix in Criterion 2.1.a.

The SPH has four academic MS degree programs:

MS, Health Policy: <http://publichealth.gwu.edu/programs/health-policy-ms>

MS, Epidemiology: <http://publichealth.gwu.edu/programs/epidemiology-ms>

MS, Public Health Microbiology & Emerging Infectious

Diseases: <http://publichealth.gwu.edu/programs/public-health-microbiology-and-emerging-infectious-diseases-ms>

MS, Exercise Science- Strength & Conditioning: <http://publichealth.gwu.edu/programs/strength-and-conditioning-ms>

The SPH has two academic PhD degree programs- See Criteria 2.12.

PhD, Epidemiology: <https://publichealth.gwu.edu/programs/epidemiology-phd>

PhD, Social and Behavioral Science in Public Health: <http://publichealth.gwu.edu/programs/social-and-behavioral-sciences-phd>

2.11.b. Identification of the means by which the school assures that students in academic curricula acquire a public health orientation. If this means is common across the school, it need be described only once. If it varies by degree or program area, sufficient information must be provided to assess compliance by each.

MS in Health Policy

The MS in Health Policy is a 48-credit program housed in the Department of HPM. The goals of the program are to provide students with the skills and knowledge to prepare them to pursue subsequent doctoral study or to enter academic or research careers as analysts in health policy for think tanks, health delivery systems, regulatory and other government agencies, or university settings. The program emphasizes individual study design and allows students to focus their training in a particular area of health policy. The table below outlines the curricular requirements.

Table 2.11.b.1.: MS, Health Policy Curriculum

Core Courses		Credits
PubH 6002	Biostatistical Applications for Public Health	3
PubH 6003	Principles and Practice of Epidemiology	3
PubH 6006	Management and Policy Approaches to Public Health	3
PubH 6242+	Clinical Epidemiology and Decision Analysis + Topics in Clinical Epidemiology and Decision Analysis (lab requirement)	2
PubH 6243		1
Total	SPH Core Course Credits	12
Required Program-Specific Courses		
Course		Credits
PUBH 6305	Fundamentals for Health Policy (prerequisite: none)	2
PUBH 6310	Statistical Analysis in Health Policy (prerequisite: PUBH 6002)	3
PUBH 6315	Introduction to Health Policy Analysis (prerequisite: PUBH 6305)	2
Advanced Analysis SELECTIVES <i>(choose one course from list below):</i>		
	PUBH 6320: Advanced Health Policy Analysis (prerequisites: PUBH 6310 and PUBH 6315)	2
	PUBH 6247: Design of Health Studies (prerequisites: PUBH 6003, 6310 and 6315)	3
	PUBH 6249: Use of Statistical Packages for Data Management and Data Analysis (prerequisites: PUBH 6310 and 6315)	3
	PUBH 6411: Global Health Qualitative Research Methods (prerequisites: PUBH 6002, 6410)	2
	PUBH 6530: Qualitative Methods/Health Promotion	2
	PUBH 6501: Evaluation of Health Promotion Disease Prevention Programs (prerequisites: PUBH 6002,6003 and permission of instructor)	3
	PUBH 6533: Design of Community Health Surveys	2
	PUBH 8417: Qualitative Research Methods and Analysis (prerequisites: instructors permission)	3
	PUBH 8419: Measurement in Public Health and Health Services Research (prerequisite: instructors permission)	3
	PPPA 6015: Benefit-Cost Analysis (prerequisites: PUBH 6310, 6315, PPPA 6014 or equivalent micro economics course and instructor's permission)	3
	PPPA 6016: Public and Non-profit Program Evaluation (prerequisites: PUBH 6310, 6315 and instructor's permission)	3
	EMSE 6740: Systems Thinking & Policy Modeling I (prerequisites: PUBH 6310 and 6315)	3
PUBH 6330 OR PUBH 6335	Health Services and Law (prerequisite: none) OR Public Health and Law (prerequisite: none)	3 OR 3
PUBH 6340	Health Economics and Financing (prerequisite: PUBH 6352 Basics of Economics or instructor's permission)	3
PUBH 6345	Health Policy Research Design	2
PUBH 6013	Master's Thesis	3
Total	Program-Specific Course Credits	20/21
Elective Courses		
Any PUBH or HSML course	A personalized combination of elective courses (depending on which Selective was taken). Any PUBH or HSML course will count as an elective toward the MS in Health	15/16 Please check the applicable semester course schedule – elective course offerings are semester-specific.

The MS in health policy requirements include 12 credits of core courses offered at the school level, which provides students with a broad public health orientation while ensuring they have the research skills necessary to conduct rigorous research. These courses include: PUBH 6002, PUBH 6003, PUBH 6006 and PUBH 6242/6243 as shown above.

As part of the program requirements, several of the courses noted in the above table are specifically in the discipline of health policy, which provides them in-depth education in this field. These include each of the courses in the PUBH 6300 series.

Several of the required courses also focus on the theoretical basis for public health and health policy interventions (e.g. health behavior, environmental health, political and policy-making theory) and research skills to meet the required competencies of the MS in Health Policy. These include PUBH 6002, PUBH 6242/6243 and PUBH 6310.

To satisfy the degree requirements, the MS, Health Policy students also take a two-credit Health Policy Research and Design course, in preparation for completing the thesis.

MS in Epidemiology

This 33-credit MS program was transferred from the CCAS to the SPH in July 2013. As part of the Department of Epi/Bio, the goals of the MS in Epidemiology are to prepare students for careers as epidemiologists in government, industry or academia and to prepare students who plan to continue their studies in a doctoral program. The program includes coursework focusing on theoretical and applied epidemiological and statistical methods as well as public health. Program requirements are outlined in Table 2.11.b.2 below.

Table 2.11.b.2.: MS, Epidemiology Curricular Requirements

Required Core Courses (22 Total Credits)		
Required Public Health Core Courses (16 Credits)		Credits
PubH 6001	Biological Concepts for Public Health	2
PubH 6002	Biostatistical Applications for Public Health	3
PubH 6003	Principles and Practice of Epidemiology	3
PubH 6247	Design of Health Studies	3
PubH 6252	Advanced Epidemiology Methods	3
PubH 6299	Topics (2 one credit courses or 1 two credit course)	2
Required Statistics Core Courses (6 Credits)		Credits
STAT 4157	Introduction to Mathematical Statistics I	3
STAT 4158	Introduction to Mathematical Statistics II	3
- OR -		
STAT 6201*	Mathematical Statistics I	3
STAT 6202*	Mathematical Statistics II	3
*Students interested in applying to the PhD degree program in Epidemiology may register in STAT 6201 and 6202, and not STAT 4157 and 4158. Advisor's approval is required before registering for STAT 6201 and STAT 6202.		
Elective Courses (8 Total Credits)		
Public Health Elective Courses		Credits
PubH 6004	Environmental and Occupational Health in a Sustainable World	2
PubH 6007	Social and Behavioral Science Approaches to Public Health	2
PubH 6121	Environmental and Occupational Epidemiology	3
PubH 6123	Toxicology: Applications for Public Health Policy	3
PubH 6124	Problem Solving in Environ & Occupational Hlth	3
PubH 6242	Clinical Epidemiology and Decision Analysis	2
PubH 6243	Topics in Clinical Epi and Decision Analysis	1
PubH 6244	Cancer Epidemiology	2
PubH 6245	Infectious Disease Epidemiology	2
PubH 6250	Epidemiology of HIV/AIDS	2
PubH 6260	Advanced Data Analysis for Public Health	2
PubH 6262	Introduction to Geographic Information Systems	1
PubH 6283	Biostatistics Consulting Practicum	1
PubH 6299	Topics in Epidemiology & Biostatistics	1-2
Statistics Elective Courses		Credits
STAT 2118	Regression Analysis	3
STAT 4181	Applied Time Series Analysis	3
STAT 3187	Introduction to Sampling	3
Consulting and Thesis (3 Credits)		
PubH 6258	Advanced Topics in Biostatistical Consulting	1
PubH 6999	Thesis	2

MS in Public Health Microbiology and Emerging Infectious Diseases (PHMEID)

Housed in the Department of Epi/Bio, the 45-credit MS in PHMEID has the following goals:

- Identify the biological complexities of microbial pathogens and the diseases they cause;
- Recognize the major epidemiologic and clinical features of microbial disease;
- Identify how new biotechnologies (including genomics, proteomics; bioinformatics) can be applied to the study and control of microbial pathogens;
- Develop an in-depth understanding of epidemiologic principles and practice; and
- Apply the principles of epidemiology, microbiology, and public health practice toward the detection, surveillance, investigation, and control of microbial diseases.

Students enrolled in the MS, PHMEID program are required to take four or more credits of Epidemiology and Biostatistics courses, a three-credit environmental and occupational health and a course in essential public health laboratory skills. Additionally, all MS, PHMEID students are required to complete a field laboratory experience during which they are exposed to applied public health and laboratory environments. The students are then required to complete a thesis (the Final Project) through which they must synthesize data acquired through epidemiologic and/or public health laboratory research.

Until the fall of 2013, the program was offered jointly with the School of Medicine. At that time, the program was moved entirely under the domain of the Department of Epi/Bio to strengthen its orientation toward public health. The MS, PHMEID program had always had a public health focus in the courses that were offered through the Department of Epi/Bio. The courses in public health microbiology, virology, genomics, and laboratory microbiology, previously offered through the School of Medicine, are now taught from the public health perspective.

Table 2.11.b.3.: MS, PHMEID Program Requirements

**Note: There are additional elective courses not listed here that might be appropriate.*

Prerequisites		Credits
Biological Sciences other than Botany		≥ 12
Chemistry		≥ 3
Calculus		≥ 3
Required Foundation Courses – 10 Credits		
Course #	Course Title	Credits
PubH 6002	Biostatistical Applications for Public Health	3
PubH 6003	Principles and Practice of Epidemiology	3
PubH 6004	Environmental & Occupational Health	2
PubH 6275	Essential Public Health Laboratory Skills	2
Required Epidemiology/Microbiology Courses – 22 Credits		
Course #	Course Title	Credits
PubH 6245	Infectious Disease Epidemiology	2
PubH 6247	Design of Health Studies	3
PubH 6249	Use of Statistical Packages: Data Management and Data Analysis	3
PubH 6259	Epidemiologic Surveillance in Public Health	2
PubH 6262	Introduction to Geographic Information Systems	1
PubH 6276	Public Health Microbiology	3
PubH 6277	Public Health Genomics	2
PubH 6278	Public Health Virology	3
MICR 8210	Infection and Immunity	3
Elective Courses – 9 Credits*		
Course #	Course Title	Credits
PubH 6127	Applied Environmental Health Microbiology	2
PubH 6132	WASH: Disaster Relief Management & Development	1
PubH 6239	Epidemiology of Foodborne and Waterborne Diseases	1
PubH 6242	Clinical Epidemiology and Decision Analysis	2
PubH 6243	Topics in Clinical Epidemiology and Decision Analysis	1
PubH 6250	Epidemiology of HIV/AIDS	2
PubH 6252	Advanced Epidemiologic Methods	3
PubH 6253	Issues in HIV/AIDS Care and Treatment	1
PubH 6261	Epi/Bio Skills Building Seminar	1
PubH 6263	Advanced Geographic Information Systems	1
PubH 6270	HIV/AIDS Surveillance	1
PubH 6271	Disaster Epidemiology: Methods and Applications	1
PubH 6299	TOPICS: Epidemiology of Sexually Transmitted Infections	2
PubH 6358	Vaccine Policy	2
PubH 6399	TOPICS: Homeland Security and Public Health	1
PubH 6484	Prevention & Control of Vector-Borne Diseases	2
PubH 6487	Emerging Zoonotic Diseases and Global Food Animal Production	1
MICR 6292	Tropical Infectious Diseases	2
Field/Laboratory Experience and Final Project – 4 Credits		
Course #	Course Title	Credits
PubH 6016	Field/Laboratory Experience	2
PubH 6280	Final Project	2

MS in Exercise Science

There have been two academic programs in the Department of Exercise and Nutrition Sciences (EXNS) - a MS in Exercise Science with a concentration in Clinical Exercise Physiology and a MS in Exercise Science with a concentration in Strength & Conditioning. SPH accepted the last cohort into the Clinical Exercise Physiology program in Fall 2014. This program will no longer be accepting new students.

The goals of the MS, Strength and Conditioning include:

- Establish scientific bases for the value of anaerobic exercise, and to provide internal and external programs that promote health behaviors across the lifespan;
- Meet an increasing demand for well-educated professionals capable of delivering a broad range of exercise-based preventive, technical, educational, and rehabilitative services;
- Gain insight into strategies for the prevention and treatment of sarcopenia, osteoporosis and childhood obesity; and
- Provide advanced training in exercise physiology as it relates specifically to resistance training for the purpose of increasing athletic performance and the prevention or treatment of inactivity-related health disorders.

All students enrolled in the MS, Exercise Science programs are required to take 30 credits of coursework and a six-credit internship for a total of 36-credits.

Table 2.11.b.4.: MS, Exercise Science Curriculum

MSES Core Courses (17 credits)		Credits
PUBH 6002	Biostatistical Applications for Public Health	3
EXNS 6202	Advanced Exercise Physiology I	3
EXNS 6203	Advanced Exercise Physiology II	3
EXNS 6207	Psychological Aspects of Sport and Exercise	3
EXNS 6208	Physical Activity: Physiology & Epidemiology	2
EXNS 6209	Advanced Concepts in Nutrition Science	3
Program Specific Courses (13 credits)		
EXNS 6220	Power Training Laboratory	2
EXNS 6221	Science and Theory of Resistance Training	3
EXNS 6222	Current Topics in Strength and Conditioning	2
EXNS 6223	Biomechanical Analysis	3
ELECTIVE	Approved by Program Director	3
Culminating Experience (6 credits)		
EXNS 6233	Graduate Internship and Comprehensive Exam	6
		0
Total Credits		36

The content of the core courses cover a breadth of information that addresses public health core areas. The social and behavioral aspects of physical activity are a primary focus of EXNS 6207. The effects of a

sedentary lifestyle and the resulting obesity problem are extensively covered in EXNS 6208. Policies relating to physical activity (such as American College of Sports Medicine physical activity guidelines) are discussed in EXNS 6202, 6203, 6208 and 6209. Examination of broad environmental factors which contribute to a sedentary lifestyle (e.g., screen time, phasing out of school physical education), as well as those that affect the food supply are themes which permeate all aspects of the program and are discussed in each class.

Over time, the MS, Exercise Science has been adapted to a hybrid delivery model, such that most coursework is now conducted online. In addition, the school-wide Curriculum Committee just approved changes to the program including adding PUBH 6002- *Biostatistical Applications for Public Health* to fill the gap in statistics content. The option to complete a thesis was eliminated for this program. All students in this program will complete the Internship and Comprehensive exam.

PhD in Epidemiology

Most PhD students in Epidemiology enter the doctoral program with an MPH degree so they have already been exposed to a public health orientation. As part of the doctoral program students are required to complete 18 credits in public health courses, and between 15 and 18 credits in either epidemiology or statistics elective courses. Those who matriculate into the PhD Epidemiology program that have an MPH degree can transfer up to 24 credits, the equivalent of the non-required public health courses, from their MPH degree towards the PhD. Students that do not have an MPH degree must complete ALL of the required public health credits and have the opportunity to take more public health courses as electives. The PhD Program Director reviews transcripts with all students, and for those without an MPH degree identifies appropriate public health courses to develop a plan of study that will encompass all educational requirements. As these students do not transfer in many credits since they do not have a MPH degree, there is additional room in the program for them to take public health courses as electives when needed. In addition, a requirement for the doctoral dissertation is a clear consideration and explication of the public health significance of their research.

PHD in Social and Behavioral Sciences in Public Health (SBS)

This newly approved program will admit its first students in the fall of 2016. The PhD in SBS will train strong theoretical, methodological, and practical scholars, whose contributions could be as practitioners or academics. Our students will be well trained in a substantive health area with a strong background in theory of social and behavior change, study design and evaluation, and statistical methods.

It is anticipated that most PhD students in SBS will enter the doctoral program with an MPH degree, thus, they will have already been exposed to a public health orientation. SBS PhD students without an MPH will be required to complete one course serving as an *Introduction to Public Health* and one course serving as an *Introduction to Epidemiology*--per personal communication with CEPH

headquarters. Additionally, the graduate director will review transcripts individually for students who do not have a MPH degree to identify areas where they are lacking in core public health education to identify an individual plan of study that will encompass these educational requirements. As they will not have likely transferred-in many credits since they do not have a MPH degree, there is room in the program for these students to take public health courses as electives to acquire these missing skills. Notably, as part of the doctoral program students are required to complete an additional 18 credits in public health courses, and 14 credits exploring more deeply their area of expertise in public health. And, a requirement for the doctoral dissertation is a clear consideration and explication of the public health significance of their research.

2.11.c. Identification of the culminating experience required for each academic degree program. If this is common across the school academic degree programs, it need be described only once. If it varies by degree or program area, sufficient information must be provided to assess compliance by each.

Examples of student work, course syllabi and rubrics and other materials are available in the electronic resource file. ***ERF 2.11.c.: Academic Programs – Student Work Samples and Materials.***

MS in Health Policy

Students in the Health Policy Master of Science program are required to complete a year-long research project that consists of a two-credit research design course (PUBH 6345-*Health Policy Research and Design*) where students are required to develop and design a research proposal, and a three-credit self-directed research thesis guided by the MS advisor. The three-credit self-directed course is used to implement the study students develop in the Health Policy Research and Design course and write up, in a scientific report format, the findings of the study.

MS in Epidemiology

Students receive practical experience in the MS program through the completion of a thesis directed by department faculty. The purpose of the thesis is to provide the student an opportunity to apply skills that go beyond the classroom experience to include the following: how to draft a proposal; how to complete a data analysis plan; how to communicate complex statistical analysis results; and how to present and defend their findings to investigators of varied scientific and quantitative backgrounds. Students present their findings to faculty in the department at the end of the semester. Faculty evaluations are the basis of the grade (credit/no credit). Students receiving a no-credit grade will work with their thesis advisor to remedy the thesis based on faculty feedback and provided a second opportunity to present and defend their research.

MS in PHMEID

All students are required to complete a final project that consists of development of a concept paper, proposal, final report, and oral presentation. These requirements are similar to those of the MPH students' Culminating Experience.

MS in Exercise Science

Students enrolled in the Strength & Conditioning concentration have had the choice of completing a six-credit internship or a six-credit thesis. Students who chose the internship option also took comprehensive exams. The comprehensive exams cover all material covered in the required Strength & Conditioning curriculum. Students who chose the thesis option defended their thesis to a faculty committee in an open forum in order to meet the requirements for graduation. However, going forward, the thesis option has been eliminated. All students in this program will now complete the internship and comprehensive exam.

Graduate students enrolled in the Clinical Exercise Physiology (CEP) program must successfully complete the American College of Sports Medicine (ACSM) Clinical Exercise Specialist® certification examination. This certification examination is typically taken in the last semester of the program. Twenty three of 24 students who have taken the exam have passed. The CEP track was deactivated in 2015 and is no longer accepting new students.

PhD in Epidemiology

The first part of student assessment are the general examinations, which are completed prior to advancing to candidacy in the PhD program and assess an advanced level of knowledge and ability to apply this knowledge in epidemiology and biostatistics. The PhD comprehensive examinations cover four areas: PUBH 6247- *Design of Health Studies*, PUBH 6252- *Advanced Epidemiologic Methods*, PUBH 8419- *Measurement in Public Health and Health Services* and PUBH 8366- *Biostatistical Methods* and are completed by students over two days prior to the start of the fall semester. Examples of the comprehensive exams are in **ERF 2.11.c** referenced earlier.

PhD students in Epidemiology are required to complete a doctoral dissertation under the guidance of a three to four member dissertation committee primarily composed of faculty from the Department of Epi/Bio. The ultimate goals and evaluation criteria for the doctoral dissertation include a significant, new contribution to the field of research chosen by the student and the demonstration of competency with an advanced statistical technique. The public health significance of the research must be clearly explained in the research proposal, and the public health impact of the research findings discussed in the final dissertation. Students are expected to comply with current NIH guidelines for research proposals, including completion of required human subject training and submission of the proposal to the GW Institutional Review Board (IRB). PhD Epidemiology students have the option of completing an

alternative dissertation that includes three manuscripts of publishable quality. Preliminary evaluation of the impact of this change in PhD curriculum, implemented in 2005, indicates that PhD Epidemiology students that use the alternative format publish their dissertation results at twice the rate of those that completed a traditional dissertation. Students are made aware of both options and choose the best option for their situation. The final dissertation is evaluated by the three-to-four member dissertation committee, as well as by one internal and one external expert in the field to provide objective assessment of the quality and contribution of the doctoral work. Almost all of the external experts that serve on the PhD Epidemiology evaluation committees are from the National Institutes of Health (NIH).

PHD in Social and Behavioral Sciences

As the dissertation is the culminating experience for these PhD students, these students will complete required coursework and pass the comprehensive exam to be officially admitted to the candidacy phase of the program. Before beginning work on their dissertation, students will enroll in a one-credit course, currently being developed as 'Advanced Theorizing in Social and Behavioral Sciences in Public Health'. Students will complete six-credits of dissertation research before becoming eligible to defend their dissertation before their Dissertation Research Committee. The dissertation process is described in Criteria 2.5.a. Doctoral students must conduct original research on a contemporary public health problem or issue and are expected to make a significant scholarly contribution and gain the expertise and skills that enable them to make a continuing impact on the field.

2.11.d. Assessment of the extent to which this criterion is met and an analysis of the school's strengths, weaknesses and plans relating to this criterion.

This criterion is met.

Strengths:

- The MS, Health Policy instituted the required two-credit course Health Policy Research and Design in 2011 to facilitate the development of scientifically rigorous MS-level thesis study. Prior to this course, students had very little exposure to how to design a health policy research project, and theses varied substantially in terms of quality. The MS in health policy also allows substantial individualization in study through the availability of 17-18 elective credits that students can use to develop a content area of expertise (e.g. maternal and child health, disparities in care, long-term care).
- The MS, Epidemiology is well established and recognized for its emphasis on quantitative methods and solid preparation for a doctoral program. This MS program also serves as a training ground for those applicants that are not ready to pursue a doctoral degree, offering an expedited, although not guaranteed, admission to the doctoral program provided there is outstanding achievement in the required MS courses.
- The PHMEID program is unique in its offerings (i.e. teaching a combination of skills related to the interface between public health and laboratory sciences with an emphasis on infectious diseases) and is one of only two such programs in the country.

- The MS, PHMEID curriculum focuses on practical skills in addition to laboratory skills. These include opportunities to become proficient in public speaking, critical thinking and communicating scientific findings. The students are challenged to interpret data to create posters, write abstracts, and give verbal presentations. Having practical laboratory skills that make the students more marketable when they matriculate.

Challenges:

- The MS Health Policy program currently lacks an MS-level qualitative course for students to introduce them to some research methodologies (e.g. qualitative research, survey design) in health policy. Discussions are underway about how to meet this need, possibly by using existing curricula in other programs.
- Faculty are exploring methods to strengthen the requirements for the culminating Final Project for the MS, PHMEID to increase the likelihood that manuscripts, instead of theses, will be created for potential publication.

Future plans:

- The MS, Health Policy faculty will do a comprehensive review of the competencies and curriculum in AY 2015-16. As part of this review, the HPM Department Curriculum Committee will identify gaps in general public health content and research skills and develop a strategy to address them through development of new courses or changes to existing course content.
- Strengthen recruitment efforts for the MS, Epidemiology degree to increase size of incoming cohorts.
- Based on an external review, the MS, Epidemiology comprehensive examinations have been eliminated beginning with the cohort that matriculated in Fall 2015. Instead, the program now requires these students to complete a thesis that will be similar to the MPH culminating experience and other MS program thesis requirements.
- The MS, Clinical Exercise Physiology is being phased out. No new students have been accepted since Fall 2014. Current students are expected to graduate by May 2016.
- The thesis option for the MS, Exercise Science in Strength & Conditioning is being eliminated beginning Fall 2016. The culminating experience will be an internship and comprehensive exam for all students. This program is converting to a hybrid model with most coursework taught online.