D1. MPH and DrPH Foundational Public Health Knowledge (SPH and PHP)

The school or program ensures that all MPH and DrPH graduates are grounded in foundational public health knowledge.

Grounding in foundational public health knowledge is measured by the student's achievement of the learning objectives listed below, or higher-level versions of the same objectives.

Profession and Science of Public Health

1. **Explain public health history, philosophy and values**
2. **Identify the core functions of public health and the 10 Essential Services**
3. **Explain the role of quantitative and qualitative methods and sciences in describing and assessing a population's health**
4. **List major causes and trends of morbidity and mortality in the US or other community relevant to the school or program**
5. **Discuss the science of primary, secondary and tertiary prevention in population health, including health promotion, screening, etc.**
6. **Explain the critical importance of evidence in advancing public health knowledge**

Factors Related to Human Health

7. **Explain effects of environmental factors on a population's health**
8. **Explain biological and genetic factors that affect a population's health**
9. **Explain behavioral and psychological factors that affect a population's health**
10. **Explain the social, political and economic determinants of health and how they contribute to population health and health inequities**
11. **Explain how globalization affects global burdens of disease**
12. **Explain an ecological perspective on the connections among human health, animal health and ecosystem health (e.g., One Health)**

The school or program validates MPH and DrPH students' foundational public health knowledge through appropriate methods, which may include the following:

- **The school or program verifies students' previous completion of a CEPH-accredited bachelor's degree in public health or MPH degree**
- **The school or program implements a test or other assessment tools that address the learning objectives listed above, or higher-level versions of the same objectives**
- **The school or program offers an online or in-person course, for credit or not-for-credit, that incorporates the learning objectives listed above, or higher-level versions of the same objectives**
- **The school or program includes the learning objectives listed above, or higher-level versions of the same objectives, in courses required of all MPH or DrPH students**

Required documentation:

1) Provide a matrix, in the format of Template D1-1, that indicates all MPH and DrPH students are grounded in foundational public health knowledge learning objectives (1-12). The matrix must identify all options for MPH and DrPH students used by the school or program. (self-study document)

Template D1-1. Foundational Public Health Knowledge Matrix

Content Coverage for Generalist MPH*	
Content	**Course number(s) and name(s) or other educational requirements**
1. Explain public health history, philosophy and values	EPH 600: Introduction to the Science and Practice of Public Health Previous completion of CEPH-accredited bachelor's degree
2. Identify the core functions of public health and the 10 Essential Services	EPH 600: Introduction to the Science and Practice of Public Health Previous completion of CEPH-accredited bachelor's degree
3. Explain the role of quantitative and qualitative methods and sciences in describing and assessing a population's health	EPH 621: Fundamentals of Epidemiology Previous completion of CEPH-accredited bachelor's degree
4. List major causes and trends in morbidity and mortality in the US or other community relevant to the school or program	EPH 600: Introduction to the Science and Practice of Public Health EPH 621: Fundamentals of Epidemiology Previous completion of CEPH-accredited bachelor's degree
5. Discuss the science of primary, secondary and tertiary prevention in population health, including health promotion, screening, etc.	EPH 600: Introduction to the Science and Practice of Public Health EPH 621: Fundamentals of Epidemiology Previous completion of CEPH-accredited bachelor's degree
6. Explain the critical importance of evidence in advancing public health knowledge	EPH 600: Introduction to the Science and Practice of Public Health EPH 621: Fundamentals of Epidemiology Previous completion of CEPH-accredited bachelor's degree
7. Explain effects of environmental factors on a population's health	EPH 600: Introduction to the Science and Practice of Public Health EPH 621: Fundamentals of Epidemiology EPH 641: Integrated Aspects of Environmental Health Previous completion of CEPH-accredited bachelor's degree
8. Explain biological and genetic factors that affect a population's health	EPH 600: Introduction to the Science and Practice of Public Health EPH 621: Fundamentals of Epidemiology EPH 641: Integrated Aspects of Environmental Health Previous completion of CEPH-accredited bachelor's degree
9. Explain behavioral and psychological factors that affect a population's health	EPH 600: Introduction to the Science and Practice of Public Health EPH 621: Fundamentals of Epidemiology Previous completion of CEPH-accredited bachelor's degree
10. Explain the social, political and economic determinants of health and how they contribute to population health and health inequities	EPH 600: Introduction to the Science and Practice of Public Health EPH 621: Fundamentals of Epidemiology Previous completion of CEPH-accredited bachelor's degree

11. Explain how globalization affects global burdens of disease	EPH 600: Introduction to the Science and Practice of Public Health EPH 621: Fundamentals of Epidemiology EPH 641: Integrated Aspects of Environmental Health Previous completion of CEPH-accredited bachelor's degree
12. Explain an ecological perspective on the connections among human health, animal health and ecosystem health (e.g., One Health)	EPH 600: Introduction to the Science and Practice of Public Health EPH 641: Integrated Aspects of Environmental Health Previous completion of CEPH-accredited bachelor's degree

*Includes MPH and joint degrees MPA, MAIA, MALAS and JD

Content Coverage for Public Health Physician (MD/MPH)	
Content	**Course number(s) and name(s) or other educational requirements**
1. Explain public health history, philosophy and values	EPH 600: Introduction to the Science and Practice of Public Health Previous completion of CEPH-accredited bachelor's degree
2. Identify the core functions of public health and the 10 Essential Services	EPH 600: Introduction to the Science and Practice of Public Health Previous completion of CEPH-accredited bachelor's degree
3. Explain the role of quantitative and qualitative methods and sciences in describing and assessing a population's health	EPH 621: Fundamentals of Epidemiology Previous completion of CEPH-accredited bachelor's degree
4. List major causes and trends in morbidity and mortality in the US or other community relevant to the school or program	EPH 600: Introduction to the Science and Practice of Public Health EPH 621: Fundamentals of Epidemiology Previous completion of CEPH-accredited bachelor's degree
5. Discuss the science of primary, secondary and tertiary prevention in population health, including health promotion, screening, etc.	EPH 600: Introduction to the Science and Practice of Public Health EPH 617: Introduction to Disease Prevention and Health Promotion EPH 621: Fundamentals of Epidemiology Previous completion of CEPH-accredited bachelor's degree
6. Explain the critical importance of evidence in advancing public health knowledge	EPH 600: Introduction to the Science and Practice of Public Health EPH 621: Fundamentals of Epidemiology Previous completion of CEPH-accredited bachelor's degree
7. Explain effects of environmental factors on a population's health	EPH 600: Introduction to the Science and Practice of Public Health EPH 641: Integrated Aspects of Environmental Health Previous completion of CEPH-accredited bachelor's degree
8. Explain biological and genetic factors that affect a population's health	EPH 641: Integrated Aspects of Environmental Health Previous completion of CEPH-accredited bachelor's degree

9. Explain behavioral and psychological factors that affect a population's health	EPH 600: Introduction to the Science and Practice of Public Health EPH 617: Introduction to Disease Prevention and Health Promotion Previous completion of CEPH-accredited bachelor's degree
10. Explain the social, political and economic determinants of health and how they contribute to population health and health inequities	EPH 600: Introduction to the Science and Practice of Public Health EPH 641: Integrated Aspects of Environmental Health Previous completion of CEPH-accredited bachelor's degree
11. Explain how globalization affects global burdens of disease	EPH 600: Introduction to the Science and Practice of Public Health EPH 641: Integrated Aspects of Environmental Health Previous completion of CEPH-accredited bachelor's degree
12. Explain an ecological perspective on the connections among human health, animal health and ecosystem health (e.g., One Health)	EPH 641: Integrated Aspects of Environmental Health Previous completion of CEPH-accredited bachelor's degree

2) Document the methods described above. This documentation must include all referenced syllabi, admissions prerequisites, as applicable. (electronic resource file)

Please see ERF D1.2 for the syllabi for the listed courses in Template D1-1 (Generalist MPH and Public Health Physician MD/MPH).

3) If applicable, assess strengths and weaknesses related to this criterion and plans for improvement in this area. (self-study document)

Strengths: Through the required curriculum for all MPH students, the program provides a grounding in the foundational public health knowledge learning objectives (1-12). Foundational public health knowledge is reinforced across numerous courses throughout the program.

Weaknesses: There are no perceived weaknesses in addressing the foundational public health knowledge learning objectives.

Plans for Improvement: Monitor syllabi, course evaluations and student survey responses to confirm that foundational knowledge is imparted and reinforced as the curriculum evolves.

D2. MPH Foundational Competencies (SPH and PHP)

All MPH graduates demonstrate the following competencies.

The school or program documents at least one specific, required assessment activity (e.g., component of existing course, paper, presentation, test) for each competency below, during which faculty or other qualified individuals (e.g., preceptors) validate the student's ability to perform the competency.

Assessment opportunities may occur in foundational courses that are common to all students, in courses that are required for a concentration or in other educational requirements, outside of designed coursework, but the school or program must assess all MPH students, at least once, on each competency. Assessment may occur in simulations, group projects, presentations, written products, etc. This requirement also applies to students completing an MPH in combination with another degree (e.g., joint, dual, concurrent degrees). For combined degree students, assessment may take place in either degree program.

The competencies are informed by the traditional public health core knowledge areas, (biostatistics, epidemiology, social and behavioral sciences, health services administration and environmental health sciences), as well as cross-cutting and emerging public health areas.

Evidence-based Approaches to Public Health

1. **Apply epidemiological methods to the breadth of settings and situations in public health practice.**
2. **Select quantitative and qualitative data collection methods appropriate for a given public health context**
3. **Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate**
4. **Interpret results of data analysis for public health research, policy or practice**

Public Health and Health Care Systems

5. **Compare the organization, structure and function of health care, public health and regulatory systems across national and international settings**
6. **Discuss the means by which structural bias, social inequities and racism undermine health and create challenges to achieving health equity at organizational, community and societal levels**

Planning and Management to Promote Health

7. **Assess population needs, assets and capacities that affect communities' health**
8. **Apply awareness of cultural values and practices to the design or implementation of public health policies or programs**
9. **Design a population-based policy, program, project or intervention**
10. **Explain basic principles and tools of budget and resource management**
11. **Select methods to evaluate public health programs**

Policy in Public Health

12. **Discuss multiple dimensions of the policy-making process, including the roles of ethics and evidence**
13. **Propose strategies to identify stakeholders and build coalitions and partnerships for influencing public health outcomes**
14. **Advocate for political, social or economic policies and programs that will improve health in diverse populations**
15. **Evaluate policies for their impact on public health and health equity**

Leadership

16. **Apply principles of leadership, governance and management, which include creating a vision, empowering others, fostering collaboration and guiding decision-making**
17. **Apply negotiation and mediation skills to address organizational or community challenges**

Communication

18. Select communication strategies for different audiences and sectors

19. Communicate audience-appropriate public health content, both in writing and through oral presentation

20. Describe the importance of cultural competence in communicating public health content

Interprofessional Practice

21. Perform effectively on interprofessional teams

Systems Thinking

22. Apply systems thinking tools to a public health issue

Required documentation:

1) List the coursework and other learning experiences required for the school or program's MPH degrees, including the required curriculum for each concentration and combined degree option. Information may be provided in the format of Template D2-1 or in hyperlinks to student handbooks or webpages, but the documentation must present a clear depiction of the requirements for each MPH degree. (self-study document)

Template D2-1. Generalist MPH and Combined Degrees Program Plans

The Generalist MPH degree requires completion of 45 credit hours. The MPH core curriculum includes 28 credits of structured coursework. Credit requirements for electives, shared credits, and the applied practice experience and integrated learning experience vary by joint degree program.

	Generalist MPH Core Curriculum	
Course Number	**Course Title**	**Credits**
EPH 600	Introduction to the Science and Practice of Public Health	3
EPH 601	Medical Biostatistics I	4
EPH 617 or EPH 620	Introduction to Disease Prevention and Health Promotion Health Education and Behavior	3
EPH 621	Fundamentals of Epidemiology	3
EPH 631 or EPH 632	Public Health Administration US Health Systems	3
EPH 641	Integrated Aspects of Environmental Health	3
EPH 607	Interdisciplinary Health Communication	3
EPH 602 or BST 625	Medical Biostatistics II Statistical Computing	3
EPH 644 or EPH 656 or EPH 647	Fundamentals of Program Evaluation Qualitative Research Methods Community-Based Participatory Research and Social Network Analysis	3
TOTAL		28

	Generalist MPH (Standalone)	
Course Number	**Course Title**	**Credits**
	Elective Coursework	12
EPH 680	Capstone Field Experience	3
EPH 682	Capstone Project	2

	Generalist JD/MPH (Joint Degree with School of Law)	
Course Number	**Course Title**	**Credits**
EPH 680	Capstone Field Experience	3
EPH 682	Capstone Project	2
	Shared Credits with JD Program (Health Law/Law Subject Area)	12

	Generalist MPA/MPH (Joint Degree with Public Administration)	
Course Number	**Course Title**	**Credits**
	Elective Coursework	6
EPH 682	Capstone Project	2
	Shared Credits with MPA Program (including POL 656 Public Service Internship)	9

	Generalist MAIA/MPH (Joint Degree with International Administration)	
Course Number	**Course Title**	**Credits**
EPH 682	Capstone Project	2
	Shared Credits with MAIA Program (including IGS 617 Practicum in International Administration)	15

	Generalist MALAS/MPH (Joint Degree with Latin American Studies)	
Course Number	**Course Title**	**Credits**
	Elective Coursework	2
	Shared Credits with MALAS Program (including EPH 680 Capstone Field Experience and LAS 810 Thesis)	15

The Public Health Physician MPH concentration requires completion of 45 credit hours. The MPH core curriculum includes 33 credits of structured coursework, 3 credits for the applied practice experience and integrated learning experience, and 9 shared credits with the MD program.

	Public Health Physician (MD/MPH* Four Year Joint Degree with the School of Medicine)	
Course Number	**Course Title**	**Credits**
EPH 600	Introduction to the Science and Practice of Public Health	3
EPH 603	Medical Biostatistics	3
EPH 617	Introduction to Disease Prevention and Health Promotion	3
EPH 621	Fundamentals of Epidemiology	3
EPH 641	Integrated Aspects of Environmental Health	3
EPH 651	Research Methods	3
EPH 652	Health Policy	3
EPH 653	Leading Change in Population Health	3
EPH 655	Health Economics and Financing	3
EPH 659	Public Health Seminar I	1
EPH 660	Public Health Seminar II	2
EPH XXX	Specialty Course (Pathways) (in development for 2023 offering)	3

EPH 678	Practicum and Capstone Project Preparation	1
EPH 682	Capstone Project	2
	Shared Credits with MD Program	9
TOTAL		**45**

*NextGEN MD curriculum plan, implemented Summer 2020

2) Provide a matrix, in the format of Template D2-2, that indicates the assessment activity for each of the foundational competencies listed above (1-22). If the school or program addresses all of the listed foundational competencies in a single, common core curriculum, the school or program need only present a single matrix. If combined degree students do not complete the same core curriculum as students in the standalone MPH program, the school or program must present a separate matrix for each combined degree. If the school or program relies on concentration-specific courses to assess some of the foundational competencies listed above, the school or program must present a separate matrix for each concentration. (self-study document)

Template D2-2. Generalist Concentration MPH

Assessment of Competencies for MPH in Generalist Concentration		
Competency	**Course number(s) and name(s)**	**Describe specific assessment opportunity**
Evidence-based Approaches to Public Health		
1. Apply epidemiological methods to the breadth of settings and situations in public health practice	EPH 621: Fundamentals of Epidemiology	Quiz #1 and quiz #3 Midterm and final examinations
2. Select quantitative and qualitative data collection methods appropriate for a given public health context	EPH 621: Fundamentals of Epidemiology	Midterm and final examinations (quantitative)
	EPH 601: Medical Biostatistics I	Theory midterm examinations (in-class and take-home) Theory final examinations (in-class and take-home) Statistical computing midterm and final examinations (quantitative)
	EPH 656: Qualitative Research Methods	Qualitative study project (methods and results section assignment) (qualitative)
	EPH 644: Fundamentals of Program Evaluation	Quiz #1 and practice assessment 7.1 Evaluation plan interim assignments (evaluation plan methods grid---group assignment; and program evaluation critique—individual assignment) (qualitative)
	EPH 647: Community-Based Participatory Research and Social Network Analysis	In-class activity #4 and written report: (1) Students will develop an egocentric digital network map using VennMaker, (2) Students will describe how to develop and change egocentric network attributes, and (3) students will describe how to use concentric circles

		and sectors inside egocentric networks (qualitative) ▪ Develop a CBPR research question associated with their VennMaker egocentric digital network map ▪ Selection of non-relational and relational attributes ▪ Selection of concentric circles and sectors ▪ Develop the data collection instrument ▪ Data collection implementation ▪ Research findings including the visualization of network graphs ▪ Discussion and recommendations from a CBPR perspective Socio-centric network (CBPR) project and presentation (quantitative and qualitative) (individual project and presentation) ▪ Focus/public health issue/research question ▪ Social network data ▪ Social network measures selection and instrument design ▪ Analytical approach ▪ Network design and implementation ▪ Data matrix and results section ▪ Discussion/community involvement
3. Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate	EPH 656: Qualitative Research Methods	Qualitative study project (methods and results/data analysis assignment) (qualitative) Software utilized includes NVivo or Dedoose
	EPH 647: Community-Based Participatory Research and Social Network Analysis	In-class activity #2 and written report: Using visual socio-centric networks for developing a CBPR collaborative network and assessing community resources Students will learn how to import data and build a socio-centric network using UCINET. ▪ Describe socio-centric network procedures applied to CBPR (e.g., recruitment instruments, data collection, data entry) ▪ Import data and build a socio-

		centric network using UCINET ▪ Calculate centrality measures and incorporate attributes in a socio-centric network ▪ Describe how to develop a social network visualization applied to CBPR using UCINET ▪ Learn how to use a CBPR socio-centric network visualizations to guide qualitative discussion groups (qualitative) Software utilized includes UCINET and VennMaker
	EPH 601: Medical Biostatistics I	Statistical computing midterm and final examinations Group project and report (quantitative) Software utilized is SAS
4. Interpret results of data analysis for public health research, policy or practice	EPH 621: Fundamentals of Epidemiology	EPI topic group presentation (interpretation and critical appraisal of epidemiology sub-specialty research) Midterm and final examinations
	EPH 601: Medical Biostatistics I	Theory midterm examinations (in-class and take-home) Theory final examinations (in-class and take-home) Statistical computing midterm and final examinations Group project and report
Public Health and Health Care Systems		
5. Compare the organization, structure and function of health care, public health and regulatory systems across national and international settings	EPH 631: Public Health Administration	US/International Healthcare Comparison Paper—students will submit a one-page summary comparing and contrasting an international healthcare system of their choice (e.g., Canada, United Kingdom, Germany, Japan, Saudi Arabia, Austria) with the US healthcare system on the following: healthcare quality and access, emergency department use, hospital admissions for key diseases (e.g., CHF, diabetes, etc.), disability adjusted life years (DALY) and other relevant parameters. Midterm examination

	EPH 632: US Health Systems	Assignment #1 US/International healthcare comparison paper—students will submit a 1,200 to 1,500-word paper comparing and contrasting key characteristics between US, UK, Canadian and Japanese health systems. Compare and contrast essay with at least 4 of the following key characteristics: cultural values and beliefs underlying each system (access to care); differences in access to care between children (under 15 years old) and seniors (over age 70); payment systems/incentives; emergency room care; hospital admissions; disability adjusted life years (DALY); life expectancy and pharmaceuticals/drug coverage.
6. Discuss the means by which structural bias, social inequities and racism undermine health and create challenges to achieving health equity at organizational, community and societal levels	EPH 620: Health Education and Behavior	Assignment #2—determinants of health and preventive interventions paper
	EPH 617: Introduction to Disease Prevention and Health Promotion	Midterm examination and final examination
Planning and Management to Promote Health		
7. Assess population needs, assets and capacities that affect communities' health	EPH 620: Health Education and Behavior	Assignment #1—community needs and asset assessment paper
	EPH 617: Introduction to Disease Prevention and Health Promotion	Midterm examination
8. Apply awareness of cultural values and practices to the design or implementation of public health policies or programs	EPH 620: Health Education and Behavior	Assignment #2—determinants of health and preventive interventions paper (didactic coverage class session #2)
	EPH 617: Introduction to Disease Prevention and Health Promotion	Final examination Essay question added to final examination (beginning Fall 2021, Q19). Question: *Please describe a scenario where implementation (aka, practitioners, facilitators) of a certain prevention program was not sensitive to the cultural needs of the target population. What are the cultural needs that were not met? What could/should have done to make the implementation of this program more culturally competent?* Rubric: Student will identify the cultural needs in this scenario, a "disconnect" or gap in these needs between the context of implementing a prevention program (to be identified by the student) that is

		specific to an element of "cultural competency", and a strategy or activity that would mitigate or eliminate the disconnect/gap. (didactic coverage class session #4)
9. Design a population-based policy, program, project or intervention	EPH 656: Qualitative Research Methods	Qualitative study project (literature review/research question assignments, methods and results section assignment, final presentation and paper assignments) (didactic coverage in class session #12, intervention development and evaluation)
	EPH 644: Fundamentals of Program Evaluation	Evaluation plan interim assignments (goals/objectives/evaluation question; stakeholder analysis; logic model; evaluation plan methods grid; analysis plan) and presentation
	EPH 647: Community-Based Participatory Research and Social Network Analysis	Socio-centric network (CBPR) project and presentation (quantitative and qualitative) (individual project and presentation) ▪ Focus/public health issue/research question ▪ Social network data ▪ Social network measures selection and instrument design ▪ Analytical approach ▪ Network design and implementation ▪ Data matrix and results section ▪ Discussion/community involvement
10. Explain basic principles and tools of budget resource management	EPH 631: Public Health Administration	Budget and resource management allocation assignment (in-class activity and table/justification written assignment)—students review a cost center report of a small clinical service at a local VA healthcare system and prepare a budget table and budget justification for the following fiscal year reassessing priorities in the resource management of key components (staff, supplies, equipment, education/travel) based on major institutional guidance to enhance the quality of care of the patient population. Four position groups will be established to each focus their updated budget proposals on different resource management principles

		(human resources, team management, resource allocation, and rewards and recognition. Each group will be assigned one topic area and meet as a group in-class to draft a budget and justification and report to the class (draft assignment), students then individually submit a written budget table and justification report to the faculty instructor (focus based on their assigned group).
	EPH 632: US Health Systems	Budget management and resource allocation exercise and paper—students review a cost center report of mental health and behavioral health healthcare system and prepare a budget table and budget justification for the following fiscal year reassessing priorities in the resource management of key components (staff, supplies, equipment, education/travel) based on major institutional guidance to enhance the quality of care of the patient population. Students address how budget and resource allocations impact access to care, treatment, and emergency utilization. Students submit a one-page summary describing 2 major issues associated with mental health, behavioral health and insurance; an Excel spreadsheet detailing revenue and expense categories for their program (a full operational budget); and a logic model corresponding to the budget for sustainability planning.
11. Select methods to evaluate public health programs	EPH 644: Fundamentals of Program Evaluation	Evaluation plan interim assignments (goals/objectives/evaluation question; stakeholder analysis; logic model; evaluation plan methods grid; analysis plan) and presentation
	EPH 656: Qualitative Research Methods	Quiz #6
	EPH 647: Community-Based Participatory Research and Social Network Analysis	In-class activity #3 written report and 10-minute video submission: Implementing a community-based social network process evaluation. Provide an overview of the CBPR process evaluation network including: ▪ Composition ▪ Strengths ▪ Weaknesses ▪ Present results

		▪ List recommended changes to the network to fix and improve the project Sociocentric network (CBPR) project and presentation (individual project and presentation) ▪ Focus/public health issue/research question ▪ Social network data ▪ Social network measures selection and instrument design ▪ Analytical approach ▪ Network design and implementation ▪ Data matrix and results section ▪ Discussion/community involvement
Policy in Public Health		
12. Discuss multiple dimensions of the policy-making process, including the roles of ethics and evidence	EPH 631: Public Health Administration	Midterm examination and final paper/presentation
	EPH 632: US Health Systems	Team midterm paper and presentation; team final paper Each student will be assigned to a 4 to 5-person team and each team will: ▪ Identify a topic dealing with a health issue; describe the problem and critical background issues of the problem, the potential stakeholders that may be involved and the policy issues/challenges with addressing the problem and several policy solutions that can be considered to address the issue ▪ Each team will interview 2-3 individuals that either currently work in or have past experience with the issue in order to round out their understanding of the problem, as well as potential solutions and leadership challenges. ▪ Each team will present their topic and background information to the class at the midterm period and submit a midterm paper (team midterm paper and presentation). ▪ Each team will then submit a

		final paper and presentation that summarizes their problem, potential stakeholders and the policy challenges and potential policy solutions. A plan or program of action will be provided that takes into account the current and future political, social and economic contexts (e.g., political changes involving a new constitution); and anticipates potential outcomes, obstacles and failures (team final paper and presentation)
13. Propose strategies to identify stakeholders and build coalitions and partnerships for influencing public health outcomes	EPH 620: Health Education and Behavior	Assignment #1—community needs and asset assessment paper
	EPH 617: Introduction to Disease Prevention and Health Promotion	In-class activity (session #8 community-based prevention systems) In-class activity (community mobilization and assessment of community needs, assets and capacities): Students are assigned to one of three groups (academic researchers, public systems representatives and community leaders). Each group is provided a different scenario involving distinct public health priorities, and is tasked with identifying and persuading one other group to collaborate to achieve outlined prevention objectives. Scenarios reflect the divergent interests, resources, funding and priorities of stakeholders collaborating in a community setting. Each group presents their model and plan to the class with the target group permitted a brief response and with evaluation and feedback from the guest lecturer and course instructor.
14. Advocate for political, social or economic policies and programs that will improve health in diverse populations	EPH 607: Interdisciplinary Health Communication	Op-ed written assignment on health equity topic Each student will submit an op-ed related to the theme of their team semester project (student teams select one of three themes--health equity issues in disasters, climate change or COVID-19)

15. Evaluate policies for their impact on public health and health equity	EPH 631: Public Health Administration	Midterm examination and final paper/presentation
	EPH 632: US Health Systems	Team midterm paper and presentation; team final paper Each student will be assigned to a 4 to 5-person team and each team will: ▪ Identify a topic dealing with a health issue; describe the problem and critical background issues of the problem, the potential stakeholders that may be involved and the policy issues/challenges with addressing the problem and several policy solutions that can be considered to address the issue ▪ Each team will interview 2-3 individuals that either currently work in or have past experience with the issue in order to round out their understanding of the problem as well as potential solutions and leadership challenges. ▪ Each team will present their topic and background information to the class at the midterm period and submit a midterm paper (team midterm paper and presentation). ▪ Each team will then submit a final paper and presentation that summarizes their problem, potential stakeholders and the policy challenges and potential policy solutions. A plan or program of action will be provided that takes into account the current and future political, social and economic contexts (e.g., political changes involving a new constitution); and anticipates potential outcomes, obstacles and failures (team final paper and presentation)

Leadership		
16. Apply principles of leadership, governance and management, which include creating a vision, empowering others, fostering collaboration and guiding decision making	EPH 607: Interdisciplinary Health Communication	The team semester project requires each team to select a topic area within the selected theme for the semester (health equity issues in disasters, climate change and COVID-19). A total of 8 deliverables will be produced per team (four professional scientific conference deliverables and four multi-media social marketing campaign deliverables), with each student to co-lead a 4-deliverable subset of activities and assume leadership responsibility for 2 deliverables. The professional scientific conference deliverables include a conference presentation abstract, a conference poster, a conference oral presentation, and a podcast. The multi-media social marketing campaign deliverables include a social marketing campaign analysis report, an infographic, a public service announcement, and a campaign class presentation. Individual performance on a team is evaluated based on the quality of the deliverables that each individual leads and teammate peer evaluations. 3MT (three-minute thesis) presentation on Kotter Leading Change principles: Students will develop and present an informational or a persuasive advocacy talk related to leadership in public health and population health science, invoking one or more of the Kotter leadership principles.
17. Apply negotiation and mediation skills to address organizational or community challenges	EPH 631: Public Health Administration	Affordable Care Act Debate and Negotiation/Mediation Exercise: Debate--students are assigned to one of three debate positions (conservative, progressive and judicial/independent) and provided a list of 8 topic areas in advance. Each position group will field one question per topic area including an opening statement, rebuttal, and closing statement. Negotiation/mediation exercise—At the conclusion of the debate, students will be reassigned into five bipartisan groups (each group will contain 3 conservative and 3 progressive members). Each group will choose a

		debate area/topic where they believe they can reach consensus and draft a bipartisan bill. Each student group will present their bipartisan bill to the class (10-15 minutes), explaining the guiding values and priorities of the negotiation for the conservatives and progressives and what allowed them to find common ground.
	EPH 632: US Health Systems	Student team debates—students will form teams of three persons, creating a Kialo debate with classmates. Teams will be paired (one team of 3 will be assigned pro and one team of 3 will be assigned con). Debate areas are assigned by the instructor (e.g., ACA, uninsured and state expansions; public investment in prevention services; vaccinations; drug legalization; healthcare tourism; universal access to dental care). Students will practice and apply negotiation and mediation skills in the context of challenges and opportunities per debate area. Students are required to apply negotiation and mediation skills in both making their own arguments and in response to their peers. The objective is not persuasion, but application of knowledge, academic data/literature and credible sources to debate.
Communication		
18. Select communication strategies for different audiences and sectors	EPH 607: Interdisciplinary Health Communication	The team semester project requires each team to select a topic area within the selected theme for the semester (health equity issues in disasters, climate change and COVID-19). A total of 8 deliverables will be produced per team (four professional scientific conference deliverables and four multi-media social marketing campaign deliverables). The professional scientific conference deliverables include a conference presentation abstract, a conference poster, a conference oral presentation, and a podcast. The multi-media social marketing campaign deliverables include a social marketing campaign analysis report, an infographic, a public service announcement, and a campaign class presentation. The team semester project components and deliverables are designed for

		different audiences, including public health and scientific colleagues in professional conferences, community leaders who can effect change, and community members who are disproportionately impacted by health inequities.

19. Communicate audience-appropriate public health content, both in writing and through oral presentation	EPH 607: Interdisciplinary Health Communication	Op-ed written assignment on health equity topic: Each student will submit an op-ed related to the theme of their team semester project (student teams select one of three themes--health equity issues in disasters, climate change or COVID-19) (written) PitchVantage practice sessions (oral) 3MT (three-minute thesis) presentation on Kotter Leading Change principles: Students will develop and present an informational or a persuasive advocacy talk related to leadership in public health and population health science, invoking one or more of the Kotter leadership principles The team semester project requires each team to select a topic area within the selected theme for the semester (health equity issues in disasters, climate change and COVID-19). A total of 8 deliverables will be produced per team (four professional scientific conference deliverables and four multi-media social marketing campaign deliverables). The professional scientific conference deliverables include a conference presentation abstract, a conference poster, a conference oral presentation, and a podcast. The multi-media social marketing campaign deliverables include a social marketing campaign analysis report, an infographic, a public service announcement, and a campaign class presentation. Individual performance on a team is evaluated based on the quality of the deliverables that each individual leads and teammate peer evaluations.
	EPH 641: Integrated Aspects of Environmental Health	Group class project (written report) and oral presentation (direct and indirect health implications of environmental

		conditions and exposures) ▪ Literature review and significance of selected environmental condition ▪ Conceptual framework—identify targeted individuals or communities at risk of adverse exposure ▪ Critique existing strategies to reduce exposure and provide recommendations to mitigate and manage adverse health effects Students indicate their percent contribution on an evaluation rubric for the group class project (written report and presentation). This is considered by the faculty instructor when assigning a final grade per student.
20. Describe the importance of cultural competence in communicating public health content	EPH 607: Interdisciplinary Health Communication	Op-ed written assignment on health equity topic: Each student will submit a op-ed related to the theme of their team semester project (student teams select one of three themes--health equity issues in disasters, climate change or COVID-19) The team semester project requires each team to select a topic area within the selected theme for the semester (health equity issues in disasters, climate change and COVID-19). A total of 8 deliverables will be produced per team (four professional scientific conference deliverables and four multi-media social marketing campaign deliverables). The professional scientific conference deliverables include a conference presentation abstract, a conference poster, a conference oral presentation, and a podcast. The multi-media social marketing campaign deliverables include a social marketing campaign analysis report, an infographic, a public service announcement, and a campaign class presentation.
Interprofessional Practice		
21. Perform effectively on interprofessional teams	EPH 607: Interdisciplinary Health Communication	*EPH 607 Interdisciplinary Health Communication* includes student enrollment from other graduate programs/professions. The course is cross-listed for registration with the School of Law and enrollment from the

		School of Nursing, College of Engineering and the Department of Physical Therapy is also arranged. Interdisciplinary teams are assigned by the faculty instructor in the first class session and the instructor ensures each team includes students from other programs/professions. Students are assigned to these teams for the duration of the semester to ensure that diverse professional experiences, knowledge and perspectives are reflected in each team's deliverables. The team semester project requires each team to select a topic area within the selected theme for the semester (health equity issues in disasters, climate change and COVID-19). A total of 8 deliverables will be produced per team (four professional scientific conference deliverables and four multi-media social marketing campaign deliverables). The professional scientific conference deliverables include a conference presentation abstract, a conference poster, a conference oral presentation, and a podcast. The multi-media social marketing campaign deliverables include a social marketing campaign analysis report, an infographic, a public service announcement, and a campaign class presentation. Individual performance on a team is evaluated based on the quality of the deliverables that each individual leads and teammate peer evaluations.
Systems Thinking		
22. Apply systems thinking tools to a public health issue	EPH 620: Health Education and Behavior	Assignment #2—Determinants of Health and Preventive Interventions paper A 6-page paper about determinants of health and an evidence-based preventive intervention to address the identified community's public health needs. Students conduct peer-reviewed literature searches using PubMed. The paper includes: a) summary of key determinants of the public health problem from an ecological and systems perspective; b) a figure illustrating the relationship

		among determinants and the public health problem using systems thinking tools (e.g. causal loop diagram); c) description and evaluation of a theoretically-informed, evidence-based preventive intervention that has been effective in preventing the problem, including an explanation of how the intervention should be adapted to be appropriate for the local community.
	EPH 617: Introduction to Disease Prevention and Health Promotion	Individual student assignment (building a logic model) Students create a logic model based on an intervention and population selected by the student related to their topic area. Students identify at least two inputs, outputs and outcomes, for each of at least two nested levels (e.g., persons, family, community, society) of the intervention.

Template D2-2. Public Health Physician Concentration (MD/MPH)

Assessment of Competencies for Public Health Physician Concentration (MD/MPH)		
Competency	**Course number(s) and name(s)**	**Describe specific assessment opportunity**
Evidence-based Approaches to Public Health		
1. Apply epidemiological methods to the breadth of settings and situations in public health practice	EPH 621: Fundamentals of Epidemiology	Class quizzes #1-9; in-class final examination
	EPH 651: Research Methods	Publishable scientific manuscript (final assignment)
2. Select quantitative and qualitative data collection methods appropriate for a given public health context	EPH 603: Medical Biostatistics	Take-home midterm examination and take-home final examination (quantitative)
	EPH 621: Fundamentals of Epidemiology	Class quizzes #1-9; in-class final examination (selection of data collection methods) (quantitative)
	EPH 651: Research Methods	Midterm examination Literature review assignment Quantitative tool assignment Journal article critique assignment Publishable scientific manuscript (final assignment (quantitative and qualitative)
3. Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate	EPH 603: Medical Biostatistics	Take-home midterm examination and take-home final examination (quantitative) Software utilized includes R
	EPH 651: Research Methods	Quantitative tool assignment Journal article critique assignment Publishable scientific manuscript (final assignment (quantitative and qualitative) Software utilized includes NVivo and SPSS
4. Interpret results of data analysis for public health research, policy or practice	EPH 603: Medical Biostatistics	Take-home midterm examination and take-home final examination
	EPH 621: Fundamentals of Epidemiology	Class quizzes #1-9; in-class final examination

Public Health and Health Care Systems		
5. Compare the organization, structure and function of health care, public health and regulatory systems across national and international settings	EPH 652: Health Policy	Assignment #1 Health Systems Quiz #1 and #2 Policy brief written report and group presentation: Students are instructed on how to present an effective evidence-based policy brief. The audience for the policy brief is a legislator who would be instrumental in bringing the policy idea to the Florida state legislature. Students are formally assessed on their own written policy brief and legislative handout (graphics) and their group presentation (presentation rubric).
6. Discuss the means by which structural bias, social inequities and racism undermine health and create challenges to achieving health equity at organizational, community and societal levels	EPH 617: Introduction to Disease Prevention and Health Promotion	Midterm examination and final examination
Planning and Management to Promote Health		
7. Assess population needs, assets and capacities that affect communities' health	MAP I and II: Medicine as a Profession	Windshield and walking surveys and team presentation: Student teams are assigned to one of 6 Miami-Dade County local communities and produce a comprehensive community health assessment by conducting windshield and walking surveys and assessing secondary data on demographics and health concerns. Student teams present to faculty and peers.
8. Apply awareness of cultural values and practices to the design or implementation of public health policies or programs	EPH 653: Leading Change in Population Health	Case study analysis (Ebola in Dallas case): Students apply awareness of cultural values and practices through a written examination of the Ebola in Dallas case. Students address whether race and cultural differences were factors in dealing with the deadly virus, and the challenges of population health on such issues. Students are also assessed on how these cultural values affect policy proposals.
9. Design a population-based policy, program, project or intervention	EPH 651: Research Methods	Publishable scientific manuscript (final assignment): Students select a public health and clinical medicine topic of interest and investigate a research question with publicly available health data

10. Explain basic principles and tools of budget resource management	EPH 655: Health Economics and Financing	Midterm examination
11. Select methods to evaluate public health programs	EPH 617: Introduction to Disease Prevention and Health Promotion	Final examination
Policy in Public Health		
12. Discuss multiple dimensions of the policy-making process, including the roles of ethics and evidence	EPH 652: Health Policy	Assignment #8 Rationing in Crisis Policy brief written report and group presentation: Students are instructed on how to present an effective evidence-based policy brief. Policy analysis requires that students use best evidence for policy effectiveness and comparative costs, evidence analysis is inherent to the policy analysis process. The audience for the policy brief is a legislator who would be instrumental in bringing the policy idea to the Florida state legislature. Students are formally assessed on their own written policy brief and legislative handout (graphics) and their group presentation (presentation rubric).
13. Propose strategies to identify stakeholders and build coalitions and partnerships for influencing public health outcomes	EPH 617: Introduction to Disease Prevention and Health Promotion	In-class activity (session #9 community-based prevention systems) In-class activity (community mobilization and assessment of community needs, assets and capacities): Students are assigned to one of three groups (academic researchers, public systems representatives and community leaders). Each group is provided a different scenario involving distinct public health priorities, and is tasked with identifying and persuading one other group to collaborate to achieve outlined prevention objectives. Scenarios reflect the divergent interests, resources, funding and priorities of stakeholders collaborating in a community setting. Each group presents their model and plan to the class with the target group permitted a brief response and with evaluation and feedback from the guest lecturer and course instructor.

	EPH 653: Leading Change in Population Health	In-class activity (Week 2, Influence, coalition building and framing your issue, multi-stakeholder collaboration) Students are placed in groups and each group is assigned a public health issue to explore its impact on a specific company. Students must identify the stakeholders involved and how they would effectively influence each group of stakeholders to attain positive public health outcomes. Each group presents their issue for faculty and student feedback (each member of the group presents to the class). Individual student grading/competency attainment is based on student's ability to identify all stakeholders, their ability to identify an effective strategy for influencing each group of stakeholders and addressing how they can effectively build coalitions.
14. Advocate for political, social or economic policies and programs that will improve health in diverse populations	EPH 652: Health Policy	Policy brief written report and group presentation: Students are instructed on how to present and write an effective evidence-based policy brief. The audience for the policy brief is a legislator who would be instrumental in bringing the policy idea to the Florida state legislature. Students are formally assessed on their written policy brief and legislative handout (graphics) and their group presentation (presentation rubric).
15. Evaluate policies for their impact on public health and health equity	EPH 652: Health Policy	Policy brief written report and group presentation: Students are instructed on how to present and write an effective evidence-based policy brief. The process for choosing the best policy requires students to consider health equity and how the most people will be impacted to provide the best health outcome in an economically feasible way. The audience for the policy brief is a legislator who would be instrumental in bringing the policy idea to the Florida state legislature. Students are formally assessed on their written policy brief and legislative handout (graphics) and their group presentation (presentation rubric).

Leadership		
16. Apply principles of leadership, governance and management, which include creating a vision, empowering others, fostering collaboration and guiding decision making	EPH 653: Leading Change in Population Health	The Miami Leadership Challenge Working in five-member teams, students engage in a two-day crisis leadership challenge. Students role-play corporate executives as they are immersed in a simulated business and media crisis. Each student team is tasked with responding to an extreme organizational and public health crisis as it unfolds. Students receive emails, social media updates, phone calls and more on the first night of the crisis. Students then collaborate, formulate a strategy, and make decisions that they present to the Board of Directors. Corporate leaders act as the Board of Directors, providing feedback to each student team. Individual student and team evaluation includes formulation of the crisis plan, a board presentation, and a communication video.
17. Apply negotiation and mediation skills to address organizational or community challenges	EPH 653: Leading Change in Population Health	Physician salary negotiation in-class exercise Students are paired to conduct two role play scenarios (organizations = university and county health department) to negotiate a hiring package and physician salary. Each student participates as the physician in one scenario and then as the hiring director/management in the second scenario. After completion of each scenario, the students and faculty instructor examine which factors led to success in their negotiation and how these skills can be used to address further organizational and community challenges.

Communication		
18. Select communication strategies for different audiences and sectors	EPH 652: Health Policy	Policy brief written report and group presentation: Students are instructed on how to present and write an effective evidence-based policy brief. The audience for the policy brief is a legislator who would be instrumental in bringing the policy idea to the Florida state legislature. Students are formally assessed on their written policy brief and legislative handout (graphics) and their group presentation (presentation rubric).
19. Communicate audience-appropriate public health content, both in writing and through oral presentation	EPH 652: Health Policy	Policy brief written report and group presentation: Students are instructed on how to present and write an effective evidence-based policy brief. The audience for the policy brief is a legislator who would be instrumental in bringing the policy idea to the Florida state legislature. Students are formally assessed on their written policy brief and legislative handout (graphics) and their group presentation (presentation rubric).
20. Describe the importance of cultural competence in communicating public health content	EPH 653: Leading Change in Population Health	Cultural competence self-assessment and student pairs exercise Each student completes a cultural competency assessment and then reflects on their results. The self-assessment is designed to help students explore their individual cultural competence. Students consider their own skills, knowledge, and awareness in interactions with others, and recognize what one can do to become more effective working and living in diverse environments. After the individual assessment, students are paired to address a situation to identify the importance of cultural competence in communicating public health content. Each student pair develops and addresses a culturally sensitive communication strategy for a challenging public health issue. Each student pair is assigned a different exercise/scenario to assess, submit a written report, and present to the class for discussion.

Interprofessional Practice		
21. Perform effectively on interprofessional teams	EPH 641: Integrated Aspects of Environmental Health	Interprofessional student teams for EPH 641 are formed through collaboration with the UM School of Law, Environmental Justice Clinic. Students demonstrate that they can perform effectively on interprofessional teams through classroom debate and a written position statement. Students from LAW 854 and EPH 641 participate in one recorded class lecture prior to the debate sessions. Students from LAW 854 attend two class sessions (two debates) and participate in outside classroom team meetings prior to their assigned debate session. Each debate session is moderated by Dr. Alberto Caban-Martinez (Public Health Sciences) and Dr. Abigail Fleming (School of Law). Students are assessed individually (by their respective program moderator). Interprofessional activity—The EPH 641 class engages in two debates, as interprofessional teams, with students from LAW 854 (Environmental Justice Clinic). Each debate will have two teams (pro/con) and each team will be comprised of 12-15 MDMPH students and 4-5 Law students. Debate topic 1: the foster care system. Debate topic 2: prison abolition. Each student (MD/MPH and LAW) prepares a written position statement for submission prior to their assigned debate.
Systems Thinking		
22. Apply systems thinking tools to a public health issue	EPH 617: Introduction to Disease Prevention and Health Promotion	Individual student assignment (building a logic model) Students create a logic model based on an intervention and population selected by the student related to their topic area. Students identify at least two inputs, outputs and outcomes, for each of at least two nested levels (e.g., persons, family, community, society) of the intervention.

3) Include the most recent syllabus for each course listed in Template D2-1, or written guidelines, such as a handbook, for any required elements listed in Template D2-1 that do not have a syllabus. (electronic resource file)

Syllabi for the required coursework in the MPH programs are available in the electronic resource files, as indicated below:

- ERF D2.3.1 Syllabi for the Generalist MPH program
- ERF D2.3.2 Syllabi for the Public Health Physician MD/MPH program

4) If applicable, assess strengths and weaknesses related to this criterion and plans for improvement in this area. (self-study document)

Strengths: All MPH students meet the foundational competencies through successful completion of required core coursework. The MPH and MD/MPH programs address and assess each foundational competency through at least one specific required assessment activity.

Weaknesses: No significant weaknesses are noted.

Plans for Improvement: Continuous review of required courses and assessment methods will occur each academic year to ensure any changes in course assignments, course structure or faculty instructor are reflected appropriately on the competency maps.

D3. DrPH Foundational Competencies (SPH and PHP, if applicable)

This criterion is not applicable.

D4. MPH and DrPH Concentration Competencies (SPH and PHP)

MPH and DrPH graduates attain competencies in addition to the foundational competences listed in Criterion D2 and D3. These competencies relate to the school or program's mission and/or to the area(s) of concentration.

The school or program defines at least five distinct competencies for each concentration or generalist degree at each degree level in addition to those listed in Criterion D2 or D3.

The list of competencies may expand on or enhance foundational competencies, but the school or program must define a specific set of statements that articulates the depth or enhancement for all concentrations and for generalist degrees. It is not sufficient to refer to the competencies in Criterion D2 or D3 as a response to this criterion.

The school or program documents at least one specific, required assessment activity (e.g., component of existing course, paper, presentation, test) for each defined competency, during which faculty or other qualified individuals (e.g., preceptors) validate the student's ability to perform the competency

The assessment activities may be spread throughout a student's plan of study.

Because this criterion defines competencies beyond the foundational competencies required of all MPH and DrPH students, assessment opportunities typically occur in courses that are required for a concentration or in courses that build on those intended to address foundational competencies. Assessment may occur in simulations, group projects, presentations, written products, etc.

If the school or program intends to prepare students for a specific credential (e.g., CHES/MCHES) that has defined competencies, the school or program documents coverage and assessment of those competencies throughout the curriculum.

Required documentation:

1) Provide a matrix, in the format of Template D4-1, that lists at least five competencies in addition to those defined in Criterion D2 or D3 for each MPH or DrPH concentration or generalist degree, including combined degree options, and indicates at least one assessment activity for each of the listed competencies. Typically the school or program will present a separate matrix for each concentration. (self-study document)

Template D4-1. Generalist MPH

Assessment of Competencies for MPH in Generalist Concentration		
Content		**Course number(s) and name(s) or other educational requirements**
1. Produce graphical displays of data that effectively summarize descriptive and analytical findings	EPH 602: Medical Biostatistics II	Homework assignments, final examination and take-home data analysis project Didactic preparation for graphical displays of data is provided in each class lecture session (SAS/R codes for boxplot, scatter plot, linear regression plot) and homework assignments provide additional practice

		opportunities for students to generate various plots (e.g., Kaplan-Meier plot, ROC plot)
	BST 625: Statistical Computing	Group project and presentation: Students will be guided to find a publicly available dataset and using the knowledge learned in the class, generate a research question, explore the dataset, and test the research question. The groups (2-3 students) will prepare a 4 to 6-minute presentation introducing their question or hypothesis, briefly explain any interesting or novel code used, answer the question or hypothesis, and present a corresponding figure showing the result or motivating the hypothesis. Each student in the group will answer direct questions from the instructor during the presentation. Evaluation is completed by the instructor for each group, and individual student, with a presentation rubric.
2. Utilize statistical software tools for reproducible research techniques and concepts in data management and analysis	EPH 602: Medical Biostatistics II	Take-home SAS coding test and take-home data analysis project Lecture #1 for introduction to reproducible research with examples for reproducibility failure. Organizing SAS/R code with comments and preparation of final datasets for conducting reproducible research are discussed throughout the course.
	BST 625: Statistical Computing	Group project and presentation: Students will be guided to find a publicly available dataset and using the knowledge learned in the class, generate a research question, explore the dataset, and test the research question. The groups (2-3 students) will prepare a 4 to 6-minute presentation introducing their question or hypothesis, briefly explain any interesting or novel code used, answer the question or hypothesis, and present a corresponding figure showing the result or motivating the hypothesis. Each student in the group will answer direct questions from the

		instructor during the presentation. Evaluation is completed by the instructor for each group, and individual student, with a presentation rubric.
3. Apply mixed methodological approaches that combine qualitative and quantitative research methods	EPH 644: Fundamentals of Program Evaluation	Group assignments and final evaluation plan/presentation Evaluation plan interim assignments (stakeholder analysis; logic model; evaluation plan methods grid; analysis plan) and presentation
	EPH 656: Qualitative Research Methods	Quiz #11
	EPH 647: Community-Based Participatory Research and Social Networking Analysis	Sociocentric network CBPR project and presentation (individual project and presentation) ▪ Identify the focus of the CBPR social network project including the public health issue/research question to be addressed, nodes, ties and attributes ▪ Generate the appropriate analysis plan---select an adequate social network data and describe the social network analytical approach ▪ Justify the selection of the directionality of your social network ▪ Describe the CBPR social network design and implementation ▪ Explain the benefits and challenges of adding CBPR to your social network project ▪ Describe CBPR participant recruitment and retention ▪ Describe CBPR social network measures selection and instrument design ▪ Provide the social network data matrix and provide results section (mixed methodology/data visualizations) ▪ Discussion—provide a critical assessment of the project's adherence to CBPR principles and community participation in its formulation, design, implementation, data collection, data analysis and

		dissemination and use of findings; discuss the validity and generalizability of your findings; identify further CBPR actions that could strengthen the social network project
4. Generate a research/evaluation question and the appropriate analysis plan	EPH 644: Fundamentals of Program Evaluation	Group assignments and final evaluation plan/presentation Evaluation plan interim assignments (goals/objectives/evaluation question; stakeholder analysis; logic model; evaluation plan methods grid; analysis plan) and presentation
	EPH 656: Qualitative Research Methods	Qualitative study project (literature review/research question assignments, methods and results section assignment, final presentation and paper assignments)
	EPH 647: Social Networking Analysis and Community-Based Participatory Research	Sociocentric network CBPR project and presentation (individual project and presentation) ▪ Identify the focus of the CBPR social network project including the public health issue/research question to be addressed, nodes, ties and attributes ▪ Generate the appropriate analysis plan--select an adequate social network data and describe the social network analytical approach ▪ Justify the selection of the directionality of your social network ▪ Describe the CBPR social network design and implementation ▪ Explain the benefits and challenges of adding CBPR to your social network project ▪ Describe CBPR participant recruitment and retention ▪ Describe CBPR social network measures selection and instrument design ▪ Provide the social network data matrix and provide results section ▪ Discussion—provide a critical assessment of the project's adherence to CBPR principles and community participation in its formulation, design,

		implementation, data collection, data analysis and dissemination and use of findings; discuss the validity and generalizability of your findings; identify further CBPR actions that could strengthen the social network project
5. Design health communication messaging and employ effective multi-media strategies for health communications	EPH 607: Interdisciplinary Health Communication	The team semester project requires each team to select a topic area within the selected theme for the semester (health equity issues in disasters, climate change and COVID-19). A total of 8 deliverables will be produced per team (four professional scientific conference deliverables and four multi-media social marketing campaign deliverables). The professional scientific conference deliverables include a conference presentation abstract, a conference poster, a conference oral presentation, and a podcast. The multi-media social marketing campaign deliverables include a social marketing campaign analysis report, an infographic, a public service announcement, and a campaign class presentation. Individual performance on a team is evaluated based on the quality of the deliverables that each individual leads and teammate peer evaluations.

*Includes MPH and joint degrees JD, MAIA, MALAS, and MPA

Template D4-1. Public Health Physician MD/MPH

Assessment of Competencies for Public Health Physician Concentration MD/MPH		
Content		**Course number(s) and name(s) or other educational requirements**
1. Develop public health research hypotheses that integrate both clinical and community research methods to address public health issues	EPH 651: Research Methods	Publishable scientific manuscript that includes: Abstract, background and significance, methods (data source, measures/variables, statistical analysis), results, data visualization (tables/figures/graphs) discussion and conclusion Students select a public health and clinical medicine topic of interest and investigate a research question with publicly available health data

2. Apply and critique select change management skills throughout real-life leadership challenges to address problem-solving, messaging, monitoring for adaptions to change and making task/activity adjustments as necessary	EPH 653: Leading Change in Population Health	Case study analysis (Barbara Norris, Leading Change in the General Surgical Unit case): Students utilize the Kotter Eight Step Change Model through a written examination of the Barbara Norton case. Students analyze the problems and potential leadership challenges presented in the case, prioritize issues, and identify viable solutions applying Kotter' Model.
3. Utilize evidence-based medicine concepts to inform public health policies and regulations	EPH 652: Health Policy	Policy brief written report and group presentation: Students are instructed on how to present and write an effective evidence-based policy brief utilizing evidence-based medicine concepts (best research evidence, clinical expertise and patient values). The audience for the policy brief is a legislator who would be instrumental in bringing the policy idea to the Florida state legislature. Students are formally assessed on their written policy brief and legislative handout (graphics) and their group presentation (group presentation rubric). Evidence-based medicine (best research evidence, clinical expertise and patient values)
4. Design an economic evaluation of a public health program or intervention	EPH 655: Health Economics and Financing	Students will identify a public health intervention, program or policy and design a poster presentation describing an economic evaluation (cost-effectiveness analysis or cost-benefit analysis) that could be used to assess economic impact and guide resource allocation decisions. This will include a discussion of the analytical perspective (the stakeholder's viewpoint), the cost categories that should be included, what outcome/outcomes are important for the intervention, potential sources of data, how the results would be presented (e.g., a cost-benefit ratio will describe the dollars in benefit generated per dollar invested in the program), potential limitations and policy relevance. The objective is to understand how to apply economic evaluation techniques and why such evaluations are important for guiding health care policy. Relevant sections of the presentation include: Introduction, program description, methodology, results and policy implications.

5. Use epidemiological data and methods to determine the effectiveness of screening and diagnostic tests used in clinical practice	EPH 621: Fundamentals of Epidemiology	Two group assignments (*group assignment 1—diagnostic accuracy PIOPED study and group assignment 3—meta-analysis systematic review*) to determine the effectiveness and validity of studies published in the medical literature that evaluate diagnostic and screening tests
6. Assess the effects of public health interventions and programs	EPH 617: Introduction to Disease Prevention and Health Promotion	Final team paper and presentation: Students will review evidence-based prevention interventions for a specific public health behavior, problem, disease or health promotion outcome for a particular population. The paper will require students to: describe the public health problem, disease or outcome; review, discuss and synthesize the existing literature on the topic (including efficacious and effective preventive interventions for the topic); and provide recommendations to strengthen preventive efforts for the selected topic. Evaluation of the presentation content includes the completeness of the literature review, depth and quality of the presentation content and organization of the material presented. Each student in the group will answer direct questions from the instructor during the presentation. Evaluation is completed by the instructor with a presentation rubric and a peer assessment form completed by each student. Midterm examination and final examination

2) For degrees that allow students to tailor competencies at an individual level in consultation with an advisor, the school or program must present evidence, including policies and sample documents, that demonstrate that each student and advisor create a matrix in the format of Template D4-1 for the plan of study. Include a description of policies in the self-study document and at least five sample matrices in the electronic resource file.

Does not apply.

3) Include the most recent syllabus for each course listed in Template D4-1, or written guidelines for any required elements listed in Template D4-1 that do not have a syllabus. (electronic resource file)

Syllabi for the required coursework in the MPH programs are available in the electronic resource files, as indicated below:

- ERF D4.3.1 Syllabi for the Generalist MPH program
- ERF D4.3.2 Syllabi for the Public Health Physician MD/MPH program

4) If applicable, assess strengths and weaknesses related to this criterion and plans for improvement in this area. (self-study document)

Strengths: The Generalist MPH and Public Health Physician MD/MPH concentration competencies are addressed and assessed through at least one specific required assessment activity.

Weaknesses: No significant weaknesses are noted.

Plans for Improvement: Continuous review of required courses and assessment methods will occur each academic year to ensure any changes in course assignments, course structure or faculty instructor are reflected appropriately on the competency maps.

D5. MPH Applied Practice Experience (SPH and PHP)

MPH students demonstrate competency attainment through applied practice experiences.

Applied practice experiences may be concentrated in time or may be spread throughout a student's enrollment. Opportunities may include the following:

- **a practicum or internship completed during a summer or academic term**
- **course-based activities (e.g., performing a needed task for a public health or health care organization under the supervision of a faculty member as an individual or group of students)**
- **activities linked to service learning, as defined by the program, school or university**
- **co-curriculum activities (e.g., service and volunteer opportunities, such as those organized by a student association)**
- **a blend of for-credit and /or not-for-credit activities**

Applied practice experiences may involve governmental, non-governmental, non-profit, industrial and for-profit settings or appropriate university-affiliated settings. To be appropriate for applied practice experience activities, university-affiliated settings must be primarily focused on community engagement, typically with external partners. University health promotion or wellness centers may also be appropriate.

The school or program identifies sites in a manner that is sensitive to the needs to the agencies or organizations involved. Activities meeting the applied practice experience should be mutually beneficial to both the site and the student.

The applied practice experiences allow each student to demonstrate attainment of at least five competencies, of which at least three must be foundational competencies (as defined in Criterion D2). The competencies need not be identical from student to student, but the applied experiences must be structured to ensure that all students complete experiences addressing at least five competencies, as specified above. The applied experiences may also address additional foundational or concentration-specific competencies, if appropriate.

The school or program assesses each student's competency attainment in practical and applied settings through a portfolio approach, which demonstrates and allows assessment of competency attainment. It must include at least two products. Examples include written assignments, journal entries, completed tests, projects, videos, multi-media presentations, spreadsheets, websites, posters, photos or other digital artifacts of learning. Materials may be produced and maintained (either by the school or program or by individual students) in any physical or electronic form chosen by the school or program.

The materials may originate from multiple experiences (e.g., applied community-based courses and service-learning courses throughout the curriculum) or a single, intensive experience (e.g., an internship requiring a significant time commitment with one site). While students may complete experiences as individuals or as groups in a structured experience, each student must present documentation demonstrating individual competency attainment.

Combined degree students have opportunities to integrate and apply their learning from both degree programs through applied practice experiences.

The school or program structures applied practice experience requirements to support its mission and students' career goals, to the extent possible.

Required documentation:

1) Briefly describe how the school or program identifies competencies attained in applied practice experiences for each MPH student, including a description of any relevant policies. (self-study document)

The Graduate Programs MPH program supports an individualized approach to the applied practice experience as students identify opportunities, engage in fieldwork, develop work products, and attain competencies. The applied practice experience offers students the opportunity to integrate and apply classroom learning in a public health work environment, while enabling them to observe and learn from professionals in the field. Students are placed in health-related settings (local, national and international) to work on projects of mutual interest to the field organization/agency and the student.

The applied practice/field experience is a required component of the MPH program. Students begin the process of identifying their individual practice experience at least one semester prior to beginning work. Students are introduced to the applied practice experience requirements at the start of their program and are encouraged to begin networking and discussing their public health interests with their faculty advisor, faculty members, fellow students, and community partners. The process to complete the applied practice experience is as follows:

- Students are encouraged to attend information sessions and community partner events from the start of their MPH program to brainstorm ideas and interests and identify/connect with community organizations
- Students may enroll in the applied practice experience after successfully completing a minimum of 9 credits in structured public health coursework
- MPH and joint MPH students enroll in *EPH 680 Practical Field Experience* (3 credits) and MD/MPH students enroll in *EPH 678 (1 credit) Practicum and Capstone Project Preparation*
- Students identify a community partner (preceptor) and applied practice/field experience site in consultation with their faculty advisor and the Program Capstone Manager
- Students complete the CITI course on the protection of human research subjects and submit a certificate of completion before field work is initiated
- Students meet with their faculty advisor to establish the timeline for completing the applied practice/field experience requirements and the required documentation
- Students consult with the faculty advisor on program competency selection and identification of work products to be submitted to demonstrate competency attainment. Students specify the target competencies for their applied practice experience in their field experience proposal, and then specify how each competency was attained in the field experience final report. A minimum of two work products are required, this includes the field experience final report and a minimum of one additional work product
- Students submit a field experience proposal, which includes an introduction of the public health topic and the community partner organization, the student's objectives and planned activities for the applied practice experience, the selection of five MPH competencies in which they will gain proficiency (minimum of three competencies must be foundational, concentration competencies may also be selected) and identification of work products that align with the selected competencies. This proposal is developed in collaboration with the community partner and the faculty advisor
- Students submit a community partner agreement, delineating the timeline for completion of activities and the expected dedicated hours
- The faculty advisor and the community partner must approve the proposal, competency form and community partner agreement before a student may begin to log hours towards their applied practice/field experience
- MPH (and joint MPH) complete 150 contact hours; MD/MPH students complete a minimum of 25 contact hours
- A log of contact hours is maintained by the student and approved by the community partner

- At the completion of the applied practice/field experience, students submit electronically (via Blackboard EPH 680 or EPH 678) their log of hours, the community partner evaluation of the student, the student evaluation, the field experience final report, and additional work products demonstrating competency attainment. The faculty advisor carefully reviews the field experience proposal and final report, as well as all additional work products, for competency attainment Students have multiple opportunities to submit a final field experience report (incorporating feedback from the faculty advisor on prior submissions)
- Each student's applied practice experience products are compiled and maintained in Blackboard and will include: CITI certification, the field experience proposal, the community partner agreement with selected competencies, a log of contact hours, the community partner evaluation, the student evaluation (maintained in Qualtrics, but the link is in Blackboard), and the work products demonstrating competency attainment (the field experience final report and a minimum of one additional work product)
- The faculty advisor, in consultation with the community partner, will evaluate the complete applied practice/field experience portfolio and assign a grade of pass/fail based upon the deliverables and the preceptor's evaluation of the student

2) Provide documentation, including syllabi and handbooks, of the official requirements through which students complete the applied practice experience. (electronic resource file)

The applied practice/field experience requirements are communicated to students in the following handbooks and websites:

Website with all MPH capstone handbooks and documents:
https://graduatestudies.publichealth.med.miami.edu/current-students/capstone-thesis/mph-capstone-and-documents/index.html

Please see ERF D5.2 for the MPH (after 2019) and MD/MPH (NextGEN) student capstone handbooks.

3) Provide samples of practice-related materials for individual students from each concentration or generalist degree. The samples must also include materials from students completing combined degree programs, if applicable. The school or program must provide samples of complete set of materials (i.e., Template D5-1 and the work products/documents that demonstrate at least five competencies) from at least five students in the last three years for each concentration or generalist degree. If the school or program has not produced five students for which complete samples are available, note this and provide all available samples. (electronic resource file)

The use of the electronic platform/portfolio (Blackboard) is required throughout the applied practice/field experience. The MPH and MD/MPH programs began using Blackboard to manage the applied practice/field experience courses in Fall 2019. Once enrolled in EPH 680 or EPH 678, students can access all required applied practice/field experience documents and assignments via the Blackboard page. Additionally, the Program Capstone Manager can communicate through bulk email messages to students enrolled in each applied practice/field experience course to remind students of assignment deadlines. Faculty Advisors can view their assigned students in the Blackboard Grade Center. Students can submit multiple drafts of each assignment, and each Faculty Advisor can approve their student's assignments. The Blackboard course management software allows students to see which documents they have submitted, and which documents have been approved by their advisor. Additionally, the Program Capstone Manager and Faculty Advisors can view all students enrolled and their progress in each applied practice/field experience course.

As noted, each student's applied practice experience portfolio is compiled and maintained in Blackboard and includes: CITI certification, the field experience proposal, the community partner agreement, a log of contact hours, the community partner evaluation, the student evaluation, the field experience final report

and additional work products demonstrating competency attainment. Template D5 is presented for our selected examples.

Examples provided do not currently include the Public Health Physician MD/MPH program. With the implementation of the NextGEN curriculum, the MD/MPH program only began utilizing program competencies in EPH 678 in 2020 (the Class of 2024, which began the program in Summer 2020). The first cohort of the NextGEN MD curriculum will reach the applied practice/field experience requirement in Fall 2021.

Please see ERF D5.3 for complete student examples.

Template D5-1.

Student 1, MPH The Children's Movement of Florida	
Specific products in portfolio that demonstrate application or practice	**Competency as defined in Criteria D2 and/or D4**
Campaign infographic Early Learning Coalition Florida Map http://www.floridaearlylearning.com/family-resources/find-quality-child-care/locate-your-early-learning-coalition Field experience final report (EPH 680)	1. Assess population needs, assets, and capacities that affect communities' health
	2. Discuss multiple dimensions of the policy-making process, including the roles of ethics and evidence
	3. Discuss the means by which structural bias, social inequities and racism undermine health and create challenges to achieving health equity at organizational, community and societal levels
	4. Communicate audience-appropriate public health content, both in writing and through oral presentation
	5. Perform effectively on interprofessional teams

Student 2, MPH Jackson HIV Clinic and University of Miami/Sylvester Comprehensive Cancer Center	
Specific products in portfolio that demonstrate application or practice	**Competency as defined in Criteria D2 and/or D4**
Hypothetical data report (de-identified data) SPARK-C Dashboard https://umiamihealth.org/en/coronavirus/spark-c Field experience final report (EPH 680)	1. Apply epidemiological methods to the breadth of settings and situations in public health practice
	2. Assess population needs, assets and capacities that affect communities' health
	3. Communicate audience-appropriate public health content, both in writing and through oral presentation
	4. Perform effectively on interprofessional teams
	5. Produce graphical displays of data that effectively summarize descriptive and analytical findings (concentration)

Student 3, MPH Florida Department of Health, Miami Dade County Epidemiology, Disease Control and Immunization	
Specific products in portfolio that demonstrate application or practice	**Competency as defined in Criteria D2 and/or D4**
Line list to investigate C. Auris cases Newsletter article Field experience final report (EPH 680)	1. Select qualitative and quantitative data collection methods appropriate for a given public health context
	2. Interpret results of data analysis for public health research, policy or practice

	3. Perform effectively on interprofessional teams
	4. Communicate audience-appropriate public health content, both in writing and through oral presentation
	5. Select communication strategies for different audiences and sectors

Student 4, MPH Miami-Dade COVID-19 Data Collection and Surveillance Project: SPARK-C	
Specific products in portfolio that demonstrate application or practice	**Competency as defined in Criteria D2 and/or D4**
SPARK-C infographic Contract tracing online course completion SPARK-C Dashboard https://umiamihealth.org/en/coronavirus/spark-c Field experience final report (EPH 680)	1. Apply epidemiological methods to the breadth of settings and situations in public health practice
	2. Assess population needs, assets and capacities that affect communities' health
	3. Select communication strategies for different audiences and sectors
	4. Communicate audience-appropriate public health content, both in writing and through oral presentation
	5. Perform effectively on interprofessional teams

Student 5, MPH/MALAS Inter-American Drug Abuse Control Commission/CICAD Database for Adolescent Alcohol and Drug Abuse Prevention Programs in Latin America and the Caribbean	
Specific products in portfolio that demonstrate application or practice	**Competency as defined in Criteria D2 and/or D4**
Systematic literature review program (Chile) Systematic literature review program (Colombia) Field experience final report (EPH 680)	1. Interpret results of data analysis for public health research, policy or practice
	2. Apply awareness of cultural values and practices to the design or implementation of public health policies or programs
	3. Advocate for political, social or economic policies and programs that will improve health in diverse populations
	4. Communicate audience-appropriate public health content, both in writing and through oral presentation
	5. Utilize reproducible research techniques and concepts (concentration)

Student 6, MPH Florida Department of Health Miami-Dade County Food and Waterborne Disease Program	
Specific products in portfolio that demonstrate application or practice	**Competency as defined in Criteria D2 and/or D4**
PowerPoint presentation on mold exposure DOH EPI Monthly Newsletter Article Submission Field experience final report (EPH 680)	1. Select quantitative and qualitative data collection methods appropriate for a given public health context
	2. Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate
	3. Apply epidemiological methods to the breadth of

	settings and situations in public health practice
	4. Describe the importance of cultural competence in communicating public health content
	5. Interpret results of data analysis for public health research, policy or practice

Student 7, MPH Broward Healthy Start Coalition/The Safe Sleep Program	
Specific products in portfolio that demonstrate application or practice	**Competency as defined in Criteria D2 and/or D4**
Safe Sleep logic model Model Programs for Infant Mortality Field experience final report (EPH 680)	1. Select quantitative and qualitative data collection methods appropriate for a given public health context.
	2. Assess population needs, assets and capacities that affect communities' health
	3. Apply awareness of cultural values and practices to the design or implementation of public health policies or programs
	4. Select communication strategies for different audiences and sectors
	5. Perform effectively on interprofessional teams

Student 8, MPH Vaccine Considerations Project (VCP)/Uniting for Action (UFA)	
Specific products in portfolio that demonstrate application or practice	**Competency as defined in Criteria D2 and/or D4**
Vaccine Considerations Project (VCP) Project Promotion and Interview Video https://unitingforaction.com/vaccine-considerations-project-join-us.asp Vaccine Considerations Project (VCP) Presentation to the University of Miami Video www.youtube.com/watch?v=d-fjszGkRAk&t=2627s SWOT Analysis of VCP Onboarding document for new VCP volunteers Field experience final report (EPH 680)	1. Perform effectively on interprofessional teams
	2. Communicate audience-appropriate public health content, both in writing and through oral presentation
	3. Apply principles of leadership, governance and management, which include creating a vision, empowering others, fostering collaboration and guiding decision-making
	4. Apply systems thinking tools to a public health issue
	5. Design health communication messaging and employ effective multi-media strategies for health communications (concentration)

4) If applicable, assess strengths and weaknesses related to this criterion and plans for improvement in this area. (self-study document)

Strengths: The applied practice/field experience requirement is a distinctive strength of the MPH program and is tailored to each student's interest and the community partner's needs. Deliverables (field experience final report and additional work products) tied to competency attainment improves the student's understanding of the skills required to work as a public health professional. For example, by delineating the target competencies in the applied practice/field experience proposal and by reviewing competency attainment in the field experience final report and additional work products, students and advisors help monitor that the applied practice experience results in public health skill development tailored to each student and experience. Dedicated staff and faculty advisors provide a supportive environment and structured process.

Weaknesses: We recognize areas which still require improvement since program competencies were incorporated into the applied practice experience in 2019. Oversight and evaluation of each project requires a considerable time commitment from faculty advisors, and compliance with meeting the program competency requirements has been uneven. Collection of all required documentation is a challenge. Compliance with competency-mapping and attainment documentation for two joint degree programs, MPA and MAIA, has not been fully implemented. These programs require students to complete a field experience/practicum within their program curriculum.

Plans for Improvement: The Graduate Programs is currently working with the MPA and MAIA program directors to expand the requirements of their field practicum/internship course to include public health competency selection and work product documentation. Faculty advisors from the Graduate Programs currently consult with joint MPA and MAIA students on the selection of their field practicum/internship experience to ensure the selection is public health appropriate. Beginning Fall 2021, in agreement with the MPA and MAIA programs, public health faculty advisors will now work closely with each joint degree student to identify public health competencies to be attained at the start of their field practicum/internship course (a public health proposal document will be submitted) and will review work products at the conclusion of the practicum/internship experience. The additional documentation of competency selection, competency attainment and work products for the MPA and MAIA practicum/internship will ensure joint degree students complete an equivalent experience to the standalone MPH applied practice experience.

The MD/MPH program (first NextGEN cohort) will begin their applied practice/field experience in Fall 2021, which will provide the first samples of EPH 678 with program competencies.

The Graduate Programs has encouraged flexibility with completion of the applied practice experience in 2020 and 2021, due to the COVID-19 pandemic. The Graduate Programs will continue to expand community partner/organizations for the applied practice/field experience requirement to provide students with a wealth of choices and locations for this program requirement. Continued training of faculty advisors and closer monitoring of portfolio products is necessary to ensure a consistent experience for all students.

D6. DrPH Applied Practice Experience (SPH and PHP, if applicable)

This criterion is not applicable.

D7. MPH Integrative Learning Experience (SPH and PHP)

MPH students complete an integrative learning experience (ILE) that demonstrates synthesis of foundational and concentration competencies. Students, in consultation with faculty, select foundational and concentration-specific competencies appropriate to the student's educational and professional goals.

The ILE represents a culminating experience and may take many forms, such as a practice-based project, essay-based comprehensive exam, capstone course, integrative seminar, etc. Regardless of form, the student produces a high-quality written product that is appropriate for the student's educational and professional objectives. Written products might include the following: program evaluation report, training manual, policy statement, take-home comprehensive essay exam, legislative testimony with accompanying supporting research, etc. Ideally, the written product is developed and delivered in a manner that is useful to external stakeholders, such as non-profit or governmental organizations.

Professional certification exams (e.g., CPH, CHES/MCHES, EEHS, RHIA) may serve as an element of the ILE, but are not, in and of themselves, sufficient to satisfy this criterion.

The ILE is completed at or near the end of the program of study (e.g., in the final year or term). The experience may be group-based or individual. In group-based experiences, the school or program documents that the experience provides opportunities for individualized assessment of outcomes.

The school or program identifies assessment methods that ensure that at least one faculty member reviews each student's performance in the ILE and ensures that the experience addressed the selected foundational and concentration-specific competencies. Faculty assessment may be supplemented with assessments from other qualified individuals (e.g., preceptors). Combined (dual, joint, concurrent) degree students have opportunities to incorporate their learning from both degree programs in a unique integrative experience.

Required documentation:

1) List, in the format of Template D7-1, the integrative learning experience for each MPH concentration, generalist degree or combined degree option that includes the MPH. The template also requires the school or program to explain, for each experience, how it ensures that the experience demonstrates synthesis of competencies. (self-study document)

Template D7-1.

MPH Integrative Learning Experience (Generalist and Public Health Physician)	
Integrative learning experience (list all options)	**How competencies are synthesized**
Capstone project paper • Program development • Program implementation • Program evaluation • Research • Health policy/advocacy	Students generate a 10 to 15-page written report using evidence-based practice (EBP) that clearly addresses a public health problem. Students self-identify competencies (minimum of 3 from foundational and/or concentration) in the proposal stage; the faculty advisor approves the proposal and identified competencies; the faculty advisor uses a rubric to review the capstone project to assess the student's ability to appropriately integrate and synthesize selected competencies.

2) Briefly summarize the process, expectations and assessment for each integrative learning experience. (self-study document)

The integrative learning experience is a required component of the MPH program. The capstone project/paper, reflective of the integrative learning experience, is geared towards providing the student with an opportunity to apply public health fieldwork (completed in the applied practice/field experience), academic theory and acquired skills to community health problems in collaboration with a public health partner. Students have the opportunity to continue their collaboration with the community partner utilized in the applied practice experience, or may collaborate with a different community partner. The topic and approach for the capstone project/paper is developed by the student, in collaboration with their community partner and faculty advisor. The approach for the capstone project is varied and can encompass either program development, program implementation, program evaluation, research, or health policy/advocacy. The process to complete the integrative learning experience is as follows:

- Students are encouraged to attend information sessions and community partner events from the start of their MPH program to brainstorm ideas and interests and identify/connect with community organizations
- The integrative learning experience is completed after successfully completing a minimum of 9 credits in structured public health coursework and successful completion of EPH 680 applied practice/field experience (MPH, 3 credits) or EPH 678 (MD/MPH,1 credit)
- MPH and joint MPH students, including MD/MPH students, enroll in *EPH 682 Capstone Project* (2 credits). EPH 682 is typically completed by students during their last semester(s) of enrollment
- Students identify capstone projects from their applied practice/field experience and their academic work, in consultation with their faculty advisor and community partner, as potential opportunities for their integrative learning experience
- Students submit, via Blackboard EPH 682, an integrative learning experience (capstone project) proposal, which includes an approval form with signature of the community partner and faculty advisor, and a written proposal outlining a rational and brief literature review, the project design, activities, materials and methods to be utilized, the anticipated outcomes, and the selection of MPH competencies to be attained. Competency selection may include the same list of competencies utilized in EPH 680/EPH 678 or may differ (a minimum of three program competences must be selected from the foundational and/or concentration)
- The faculty advisor must approve the capstone project proposal with selected competencies before a student may begin work towards their capstone project. If IRB approval is required for the capstone project, students must obtain approval (and submit a copy of approval with their capstone project final report via Blackboard EPH 682)
- At the completion of the integrative learning experience, students submit (via Blackboard EPH 682) the capstone project final report to the faculty advisor. Students have multiple opportunities to submit a capstone project final report (incorporating feedback from the faculty advisor on prior submissions)
- Each student's integrative learning experience products are compiled and maintained in Blackboard and include: the integrated learning experience (capstone project) written proposal and approval form with identification of selected competencies, the capstone project final paper, and the grading rubric
- The faculty advisor, in consultation with the community partner, will evaluate the complete integrated learning experience portfolio and assign a grade of pass/fail using the final report rubric for EPH 682

3) Provide documentation, including syllabi and/or handbooks, that communicates integrative learning experience policies and procedures to students. (electronic resource file)

The integrative learning experience policies and procedures are communicated to students in the following handbooks and websites:

Website with all MPH capstone handbooks and documents:
https://graduatestudies.publichealth.med.miami.edu/current-students/capstone-thesis/mph-capstone-and-documents/index.html

Please see ERF D7.3 for the MPH (after 2019) and MD/MPH (NextGEN) student capstone handbooks.

4) Provide documentation, including rubrics or guidelines, that explains the methods through which faculty and/or other qualified individuals assess the integrative learning experience with regard to students' demonstration of the selected competencies. (electronic resource file)

Please see ERF D7.4 for the assessment rubric for evaluating the integrative learning/capstone project and demonstration of competencies.

5) Include completed, graded samples of deliverables associated with each integrated learning experience option from different concentrations, if applicable. The school or program must provide at least 10% of the number produced in the last three years or five examples, whichever is greater. (electronic resource file)

The use of the electronic platform/portfolio (Blackboard) is required throughout the integrative learning experience. The MPH and MD/MPH program began using Blackboard to manage the integrative learning experience (capstone project) course in Fall 2019. Once enrolled in EPH 682, students can access all required capstone project documents and assignments via the Blackboard page. Additionally, the Program Capstone Manager can communicate through bulk email messages to students enrolled in each integrative learning experience course to remind students of assignment deadlines. Students can submit multiple drafts of each assignment, and each Faculty Advisor can approve their students' assignments. The Blackboard course management software allows students to see which documents they have submitted, and which documents have been approved by their advisor. Additionally, the Program Capstone Manager and Faculty Advisor can view all students enrolled and their progress in the integrative learning experience course.

Each student's integrative learning experience portfolio is compiled and maintained in Blackboard and includes: the integrative learning experience (capstone project) written proposal and approval form with identification of selected competencies, and the capstone project final paper.

Examples provided do not currently include the MD/MPH program. With the implementation of the NextGEN curriculum, the MD/MPH program only began utilizing program competencies in EPH 682 in 2020 (the Class of 2024, which began the program in Summer 2020). The first cohort of the NextGEN MD curriculum will reach the integrative learning experience requirement (proposal) in Fall 2021.

Please see ERF D7.5 for complete student examples.

6) If applicable, assess strengths and weaknesses related to this criterion and plans for improvement in this area. (self-study document)

Strengths: The integrative learning experience (capstone project) demonstrates student's ability to apply and synthesize knowledge, skills and competencies attained throughout the MPH program and produces a tangible work product that may be useful to the community partner organization/external stakeholders. The flexibility in the capstone project approach and individual student selection of program competencies permits students to tailor their experience to their career goals. Dedicated staff (Program Capstone Managers) for the MPH and MD/MPH programs, in addition to faculty advisors who work with the students from the start of the MPH program to completion (including the APE and ILE portions of the program), provide a supportive environment and structured process.

Weaknesses: Oversight and evaluation of each project requires a considerable time commitment from faculty advisors. With the joint degree program plan for MALAS requiring students to complete a thesis with the other master's program, inclusion of the MPH program competencies and documentation of their attainment in the integrative learning experience is a challenge.

Plans for Improvement: The Graduate Programs is currently working with the MALAS program director to expand the requirements in their culminating experience (thesis) to include public health competency documentation. Beginning Fall 2021, in agreement with MALAS program, public health faculty advisors will now work closely with each joint degree student to select public health competencies (a public health proposal document will be submitted) and will review the written product to assess the student's ability to integrate and synthesize selected competencies. The MPH faculty advisor may serve as the outside committee member on the thesis committee. The additional documentation of competency selection and competency attainment within the thesis requirement will ensure joint degree students complete an equivalent experience to the standalone MPH integrative learning experience.

The MD/MPH program (first NextGEN cohort) will begin their integrative learning experience (proposal) in Fall 2021, which will provide the first samples of EPH 682 with program competencies. Continued training of faculty advisors and closer monitoring of portfolio products is necessary to ensure a consistent experience for all students.

D8. DrPH Integrative Learning Experience (SPH and PHP, if applicable)

This criterion is not applicable.

D9. Public Health Bachelor's Degree General Curriculum (SPH and PHP, if applicable)

This criterion is not applicable.

D10. Public Health Bachelor's Degree Foundational Domains

This criterion is not applicable.

D11. Public Health Bachelor's Degree Foundational Competencies

This criterion is not applicable.

D12. Public Health Bachelor's Degree Cumulative and Experiential Activities

This criterion is not applicable.

D13. Public Health Bachelor's Degree Cross-Cutting Concepts and Experiences

This criterion is not applicable.

D14. MPH Program Length (SPH and PHP)

An MPH degree requires at least 42 semester-credits, 56 quarter-credits or the equivalent for completion.

Schools and programs use university definitions for credit hours.

Required documentation:

1) Provide information about the minimum credit-hour requirements for all MPH degree options. If the university uses a unit of academic credit or an academic term different from the standard semester or quarter, explain the difference and present an equivalency in table or narrative form. (self-study document)

The minimum credit requirement for the standard MPH and joint degree programs is 45 semester-credits. The joint degree programs include a limited number of shared credits across the two graduate degree programs.

Program	Minimum Credit Requirement
MPH	45
MD/MPH	211 (45 for the MPH)
MPA/MPH	66 (45 for the MPH)
JD/MPH	115 (45 for the MPH)
MAIA/MPH	60 (45 for the MPH)
MALAS/MPH	60 (45 for the MPH)

2) Define a credit with regard to classroom/contact hours. (self-study document)

The University of Miami adopted the following Federal Definition of the Credit Hour at the Faculty Senate meeting on April 17, 2013 that appears in the credit hour policy statement of the Southern Association of Colleges and Schools Commission on Colleges (SACSCOC). The policy statement of the SACSCOC reads: *Not less than one hour of classroom or direct faculty instruction and a minimum of two hours of out of class student work each week for approximately fifteen weeks for one semester or trimester credit hour, or ten to twelve weeks for one quarter credit hour, of the equivalent amount of work over a different amount of time.*

The University of Miami adheres to a reasonable approximation of the Carnegie unit for contact time. The Academic Calendar is maintained by the University Registrar and is the official record of academic instruction. The University of Miami Academic Bulletin defines a traditionally delivered course as a three-credit hour face-to-face course in which students and instructor meet at a regular time over a 15-week semester for a total of 45 contact hours (fall and spring semesters). A semester credit hour is defined as not less than one hour of formalized instruction and at least two hours of out-of-class student work each week for approximately 15 weeks for one semester or the equivalent amount of work over a different amount of time (summer semesters and intersession).

D15. DrPH Program Length (SPH and PHP, if applicable)

This criterion is not applicable.

D16. Bachelor's Degree Program Length (SPH and PHP, if applicable)

This criterion is not applicable.

D17. Academic Public Health Master's Degrees (SPH and PHP, if applicable)

Students enrolled in the unit of accreditation's academic public health master's degrees (e.g., MS in biostatistics) complete a curriculum that is based on defined competencies; produce an appropriately rigorous discovery-based paper or project at or near the end of the program of study; and have the opportunity to engage in research at a level appropriate to the degree program's objectives.

These students also complete coursework and other experiences, outside of the major paper or project, that substantively address scientific and analytic approaches to discovery and translation of public health knowledge in the context of a population health framework.

Finally, students complete coursework that provides instruction in the foundational public health knowledge at an appropriate level of complexity. This instruction may be delivered through online, in-person or blended methodologies, but it must meet the following requirements while covering the defined content areas.

- **The instruction includes assessment opportunities, appropriate to the degree level, that allow faculty to assess students' attainment of the introductory public health learning objectives. Assessment opportunities may include tests, writing assignments, presentations, group projects, etc.**

- **The instruction and assessment of students' foundational public health knowledge are equivalent in depth to the instruction and assessment that would typically be associated with a three-semester-credit class, regardless of the number of credits awarded for the experience or the mode of delivery.**

The school or program identifies at least one required assessment activity for each of the following foundational public health learning objectives.

Profession and Science of Public Health

1. **Explain public health history, philosophy and values**
2. **Identify the core functions of public health and the 10 Essential Services**
3. **Explain the role of quantitative and qualitative methods and sciences in describing and assessing a population's health**
4. **List major causes and trends of morbidity and mortality in the US or other community relevant to the school or program**
5. **Discuss the science of primary, secondary and tertiary prevention in population health, including health promotion, screening, etc.**
6. **Explain the critical importance of evidence in advancing public health knowledge**

Factors Related to Human Health

7. **Explain effects of environmental factors on a population's health**
8. **Explain biological and genetic factors that affect a population's health**
9. **Explain behavioral and psychological factors that affect a population's health**
10. **Explain the social, political and economic determinants of health and how they contribute to population health and health inequities**
11. **Explain how globalization affects global burdens of disease**
12. **Explain an ecological perspective on the connections among human health, animal health and ecosystem health (e.g., One Health)**

The school or program validates academic public health master's students' foundational public health knowledge through appropriate methods, which may include the following:

• The school or program verifies students' previous completion of a CEPH-accredited degree (bachelor's, master's or doctoral degree)

• The school or program implements a test or other assessment tools that address the learning objectives listed above, or higher-level versions of the same objectives

• The school or program offers an online or in-person course, for credit or not-for-credit, that incorporates the learning objectives listed above, or higher-level versions of the same objectives

• The school or program includes the learning objectives listed above, or higher-level versions of the same objectives, in courses required of all academic public health master's students

Required documentation:

1) List the curricular requirements for each relevant degree in the unit of accreditation. (self-study document)

The Graduate Programs in Public Health offers academic master's degrees in biostatistics, climate and health, prevention science and community health and public health. The MS degrees offered require 33 – 45 credits to complete and are awarded by the Graduate School.

Biostatistics MS Degree

The master's program in biostatistics is an applied one-year program intended for quantitative students seeking training in applied biostatistics. The program emphasizes applications and understanding of statistical concepts rather than theoretical and mathematical principles. The MS in Biostatistics degree provides students with the necessary background for applying good biostatistical practices in real-world settings. Students gain practical skills that can be applied immediately to a variety of data settings, which include, but are not limited to, the biological life sciences, public health, medical studies, and health services research.

The degree consists of 33 credits of coursework covering introductory probability, biostatistics, introductory epidemiology and public health, computing, clinical trials, survival analysis, and mathematical statistics. Enrichment is provided by a statistical practicum, a seminar and health research course. Pre-requisites to the program include introductory calculus, introductory linear algebra and introductory computing.

Course Number	Course Title	Credits
BST 603	Introduction to Probability Theory and its Applications	3
BST 625	Statistical Computing	3
EPH 703	Advanced Statistical Methods I	4
EPH 705	Advanced Statistical Methods II	3
BST 605	Statistical Principles in Clinical Trials	3
EPH 751	Survival Analysis in Clinical Trials	3
EPH 600	Introduction to the Science and Practice of Public Health	3
EPH 621	Fundamentals of Epidemiology	3
BST 650	Topics in Biostatistics Seminar	1 (X 2 semesters)
BST 610	Introduction to Statistical Collaboration	3
BST 692	Data Science and Machine Learning for Health Research	3

Climate and Health MS Degree

The master's program in climate and health trains future generations of professionals, research analysts, planners, decision-makers, and leaders to address the intricate relationship between human health and climate, climate change and weather patterns and weather anomalies (C^2W^2). The degree consists of 36 credits of coursework covering weather, climate and health, weather toxicology, climate and health data, including its sources, types and integration, as well as modeling the health effects of climate and weather, and the policies and management of the health effects of climate and weather.

Course Number	Course Title	Credits
EPH 600	Introduction to the Science and Practice of Public Health	3
ATM 614	Introduction to Weather and Climate	3
EPH 646	Climate and Health	3
EPH 657	Toxicology, Climate and Health	3
EPH 633	Policies and Management of the Health Effects of Climate	3
EPH 727	Climate, Environment and Health: Data Integration and Management	3
EPH 729	Analysis of the Health Effects of Climate	3
	Electives	9
EPH 698	Thesis Proposal	3
EPH 699	Thesis	3

Prevention Science and Community Health MS Degree

The master's program in prevention science and community health is a 33-credit hour program intended to provide students with training in the fundamentals of prevention science, including (a) the assessment of risk and protective factors that predict and modify health and behavior outcomes, (b) the development of preventive interventions that target these risk and protective factors, and (c) the implementation and evaluation of these interventions. Students will develop skills in translating prevention research into demonstrable preventive action, and successfully partner with communities and organizations for the implementation of evidence-based preventive interventions.

The curriculum consists of required coursework in prevention science and public health, coursework in statistics/research methodology, credit hours in elective coursework and required credit hours dedicated to proposing and completing a research thesis.

Course Number	Course Title	Credits
EPH 600	Introduction to the Science and Practice of Public Health	3
EPH 617	Introduction to Disease Prevention and Health Promotion	3
EPH 623	Determinants of Health and Health Disparities Across the Life Course	3
EPH 717	Integrating Behavioral Health Theories and Models into Prevention Science	3
EPH 731	Designing and Adapting Preventive Interventions	3
EPH 732	Introduction to Dissemination and Implementation Science	3
	Statistics/Research Methods	6
	Electives	3
EPH 698	Thesis Proposal	3
EPH 699	Thesis	3

Public Health MS Degree

The MSPH is an academic research degree designed to prepare students for further study at the doctoral level or to prepare for research or technical positions in government, industry, academia, or private institutions. Studies include many of the core disciplines included in the MPH degree, with an additional emphasis on advanced research methods and quantitative analysis skills. The 45-credit degree program consists of coursework in core public health disciplines (epidemiology, biostatistics, environmental health science, health administration/policy, and social/behavioral health), 11 credits of elective coursework, 6 credits of research methodology, and 6 credits for a public health thesis.

Course Number	Course Title	Credits
EPH 600	Introduction to the Science and Practice of Public Health	3
EPH 601	Medical Biostatistics I	4
EPH 602	Medical Biostatistics II	3
EPH 617 or EPH 620	Introduction to Disease Prevention and Health Promotion OR Health Education and Behavior	3
EPH 621	Fundamentals of Epidemiology	3
EPH 631 or EPH 632	Public Health Administration OR US Health Systems	3
EPH 641	Integrated Aspects of Environmental Health	3
	Research Methodology /Quantitative Analysis (two methods courses required)	6
	Electives	11
EPH 698	Thesis Proposal	3
EPH 699	Thesis	3

2) Provide a matrix, in the format of Template D17-1, that indicates the required assessment opportunities for each of the defined foundational public health learning objectives (1-12). Typically, the school or program will present a separate matrix for each degree program, but matrices may be combined if requirements are identical. (self-study document)

Template D17-1.

Biostatistics MS Degree and the Public Health MS Degree

Content Coverage for Academic Master's Degrees (MS Biostatistics and MS Public Health)		
Content	**Course number(s) or other educational requirements**	**Specific assessment opportunity**
1. Explain public health history, philosophy and values	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination
2. Identify the core functions of public health and the 10 Essential Services	EPH 600: Introduction to the Science and Practice of Public Health	Final examination
3. Explain the role of quantitative and qualitative methods and sciences in describing and assessing a population's health	EPH 621: Fundamentals of Epidemiology	Quiz #1 Midterm examination

4. List major causes and trends of morbidity and mortality in the US or other community relevant to the school or program	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination
	EPH 621: Fundamentals of Epidemiology	Quiz #2 Midterm examination
5. Discuss the science of primary, secondary and tertiary prevention in population health including health promotion, screening, etc.	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination
	EPH 621: Fundamentals of Epidemiology	Homework assignment #1 and #12 Quiz #1 and #3 Final examination
6. Explain the critical importance of evidence in advancing public health knowledge	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination
	EPH 621: Fundamentals of Epidemiology	Quiz #3 EPI topic group presentation Final examination
7. Explain effects of environmental factors on a population's health	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination
	EPH 621: Fundamentals of Epidemiology	Homework assignment #1 Final examination
8. Explain biological and genetic factors that affect a population's health	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination
	EPH 621: Fundamentals of Epidemiology	Homework assignment #1 Midterm examination
9. Explain behavioral and psychological factors that affect a population's health	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination
	EPH 621: Fundamentals of Epidemiology	Homework assignment #1 Final examination
10. Explain the social, political and economic determinants of health and how they contribute to population health and health inequities	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination
	EPH 621: Fundamentals of Epidemiology	Midterm examination Final examination
11. Explain how globalization affects global burdens of disease	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination
	EPH 621: Fundamentals of Epidemiology	Quiz #1 Midterm examination
12. Explain an ecological perspective on the connections among human health, animal health and ecosystem health (e.g., One Health)	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination

Climate and Health MS Degree

Content Coverage for Academic Master's Degrees (MS in Climate and Health)		
Content	**Course number(s) or other educational requirements**	**Specific assessment opportunity**
1. Explain public health history, philosophy and values	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination
	EPH 646: Climate and Health	Quiz #1 Final examination
2. Identify the core functions of public health and the 10 Essential Services	EPH 600: Introduction to the Science and Practice of Public Health	Final examination
	EPH 646: Climate and Health	Quiz #3 Final examination
3. Explain the role of quantitative and qualitative methods and sciences in describing and assessing a population's health	EPH 600: Introduction to the Science and Practice of Public Health	Final examination
	EPH 727: Climate, Environment and Health: Data Integration and Management	Research paper reviews: six assignments (select research papers assigned by the instructor) where students write a critical review on the methods and data used, reliability of the research design and types and sources of the data, potential challenges and/or problems in the integration/collection of multiple data sets and credibility of the research findings in light of the data and methodology used.
4. List major causes and trends of morbidity and mortality in the US or other community relevant to the school or program	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination
	EPH 646: Climate and Health	Final examination
5. Discuss the science of primary, secondary and tertiary prevention in population health including health promotion, screening, etc.	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination
6. Explain the critical importance of evidence in advancing public health knowledge	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination
	EPH 657: Toxicology, Climate and Health	Final examination
7. Explain effects of environmental factors on a population's health	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination
	EPH 646: Climate and Health	Quiz #2 Final examination

8. Explain biological and genetic factors that affect a population's health	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination
	EPH 657: Toxicology, Climate and Health	Final examination Laboratory notebook reports
9. Explain behavioral and psychological factors that affect a population's health	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination
	EPH 657: Toxicology, Climate and Health	Final examination
10. Explain the social, political and economic determinants of health and how they contribute to population health and health inequities	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination
11. Explain how globalization affects global burdens of disease	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination
	EPH 646: Climate and Health	Quiz #2 Final examination
	EPH 657: Toxicology, Climate and Health	Final examination
12. Explain an ecological perspective on the connections among human health, animal health and ecosystem health (e.g., One Health)	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination
	EPH 646: Climate and Health	Quiz #2 Final examination

Prevention Science and Community Health MS Degree

Content Coverage for Academic Master's Degrees (MS in Prevention Science and Community Health)		
Content	**Course number(s) or other educational requirements**	**Specific assessment opportunity**
1. Explain public health history, philosophy and values	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination
2. Identify the core functions of public health and the 10 Essential Services	EPH 600: Introduction to the Science and Practice of Public Health	Final examination
3. Explain the role of quantitative and qualitative methods and sciences in describing and assessing a population's health	EPH 617: Introduction to Disease Prevention and Health Promotion	Midterm examination Final examination
	EPH 623: Determinants of Health and Health Disparities Across the Life Course	Paper #1: Health inequities, social determinants of health and GIS mapping
4. List major causes and trends of morbidity and mortality in the US or other community relevant to the school or program	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination

5. Discuss the science of primary, secondary and tertiary prevention in population health including health promotion, screening, etc.	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination
	EPH 617: Introduction to Disease Prevention and Health Promotion	Midterm examination Final examination
6. Explain the critical importance of evidence in advancing public health knowledge	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination
	EPH 617: Introduction to Disease Prevention and Health Promotion	Midterm examination Final examination
7. Explain effects of environmental factors on a population's health	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination
	EPH 623: Determinants of Health and Health Disparities Across the Life Course	Paper #2: Using ecological and life course models to analyze and understand determinants of health
8. Explain biological and genetic factors that affect a population's health	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination
	EPH 623: Determinants of Health and Health Disparities Across the Life Course	Paper #2: Using ecological and life course models to analyze and understand determinants of health
9. Explain behavioral and psychological factors that affect a population's health	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination
	EPH 623: Determinants of Health and Health Disparities Across the Life Course	Paper #2: Using ecological and life course models to analyze and understand determinants of health
10. Explain the social, political and economic determinants of health and how they contribute to population health and health inequities	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination
	EPH 623: Determinants of Health and Health Disparities Across the Life Course	Paper #1: Health inequities, social determinants of health and GIS mapping Paper #2: Using ecological and life course models to analyze and understand determinants of health
11. Explain how globalization affects global burdens of disease	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination
	EPH 623: Determinants of Health and Health Disparities Across the Life Course	Paper #2: Using ecological and life course models to analyze and understand determinants of health
12. Explain an ecological perspective on the connections among human health, animal health and ecosystem health (e.g., One Health)	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination
	EPH 623: Determinants of Health and Health Disparities Across the Life Course	Oral presentation of papers #1 and #2

3) Provide a matrix, in the format of Template D17-2, that lists competencies for each relevant degree and concentration. The matrix indicates at least one assessment activity for each of the listed competencies. Typically, the school or program will present a separate matrix for each concentration. Note: these competencies are defined by the school or program and are distinct from the foundational public health learning objectives defined in this criterion. (self-study document)

Template D17-2.

Assessment of Competencies for MS in Biostatistics		
Content	**Course number(s) or other educational requirements**	**Specific assessment opportunity**
1. Apply epidemiologic and statistical methods to the measurement and study of population health and the prevention of infectious and chronic disease	EPH 703: Advanced Statistical Methods I	Statistical computing midterm examinations #1 and #2 (in-class) Theory midterm examinations (take-home and in-class) Final examinations (theory and statistical computing)
	EPH 621: Fundamentals of Epidemiology	Quiz #1 and quiz #3 Midterm examination and final examination
2. Describe concepts in probability theory, random variation and commonly used statistical distribution and mathematical statistics	BST 603: Introduction to Probability and its Applications	Midterm examinations (2) Final examination
	BST 605: Statistical Principles in Clinical Trials	Homework assignments Midterm examination and final examination: assessing sample size and power considerations for different trial designs as well as different types of endpoints including binary, continuous, survival, parametric, nonparametric
3. Develop sample size and power calculations for different study designs including those from clinical trials and observational studies	BST 605 Statistical Principles in Clinical Trials	Homework assignments Midterm examination and final examination: all use and reinforce knowledge of probability theory, variance and distributional assumptions
	EPH 751: Survival Analysis in Clinical Trials	Final examination
4. Perform a variety of basic and advanced statistical analyses (estimation and inference) including ANOVA, univariate and multiple regression models, generalized linear modeling, multivariate analysis, survival analysis, design of experiments,	EPH 703: Advanced Statistical Methods I	Statistical computing midterm examinations #1 and #2 Theory midterm examinations (take-home and in-class) Final examinations (theory and statistical computing)

various new techniques from statistical learning theory, analyze longitudinal data	EPH 705: Advanced Statistical Methods II	Weekly homework assignments Midterm examination and final examination

5. Apply quantitative and reasoning skills as well as content-area knowledge to analyze data from epidemiological, clinical, observational and experimental studies	BST 625: Statistical Computing	Group project and presentation: Students will be guided to find a publicly available dataset and will generate a research question, explore the dataset, and test the research question. The groups (2-3 students) will prepare a 4 to 6-minute presentation introducing their question or hypothesis, briefly explain any interesting or novel code used, answer the question or hypothesis, and present a corresponding figure showing the result or motivating the hypothesis. Each student in the group will answer direct questions from the instructor during the presentation. Evaluation is completed by the instructor for each group, and individual student, with a presentation rubric.
	EPH 703: Advanced Statistical Methods I	Group project and presentation: The objective is to use regression modeling techniques to determine predictors of length of hospital stay, which is defined by days between hospital discharge and hospital admission (myocardial infarction/heart attack study data). The written summary report includes abstract, introduction and background, methods, results, discussion, limitations and conclusions, and tables and figures. The final group project/presentation grade is weighted, consisting of individual student contribution (per student contribution indicated in the written report) and a group project evaluation by the instructor (80%) and the student/peer evaluation (20%). Statistical computing midterm examinations #1 and #2 (in-class)

		Theory midterm examinations (take-home and in-class) Final examinations (theory and statistical computing)
6. Interpret results from explanatory and descriptive data analysis and advanced statistical analyses to draw relevant conclusions from data	EPH 703: Advanced Statistical Methods I	Group project and presentation: The objective is to use regression modeling techniques to determine predictors of length of hospital stay, which is defined by days between hospital discharge and hospital admission (myocardial infarction/heart attack study data). The written summary report includes abstract, introduction and background, methods, results, discussion, limitations and conclusions, and tables and figures. The final group project/presentation grade is weighted, consisting of individual student contribution (per student contribution indicated in the written report) and a group project evaluation by the instructor (80%) and the student/peer evaluation (20%). Statistical computing midterm examinations #1 and #2 (in-class) Theory midterm examinations (take-home and in-class) Final examinations (theory and statistical computing)
	EPH 705: Advanced Statistical Methods II	Weekly homework assignments Midterm examination and final examination
7. Develop a high level of competency in statistical programming both in R and SAS for both managing and analyzing data	BST 625: Statistical Computing	Group project and presentation: Students will be guided to find a publicly available dataset and will generate a research question, explore the dataset, and test the research question. The groups (2-3 students) will prepare a 4 to 6-minute presentation introducing their question or hypothesis, briefly explain any interesting or novel code used, answer the question or hypothesis, and present a corresponding figure showing the result or motivating the hypothesis.

		Each student in the group will answer direct questions from the instructor during the presentation. Evaluation is completed by the instructor for each group, and individual student, with a presentation rubric.
8. Communicate effectively by producing summary reports, statistical analysis sections of papers, graphical summaries and tabular summaries of data	EPH 703: Advanced Statistical Methods I	Group project and presentation: The objective is to use regression modeling techniques to determine predictors of length of hospital stay, which is defined by days between hospital discharge and hospital admission (myocardial infarction/heart attack study data). The written summary report includes abstract, introduction and background, methods, results, discussion, limitations and conclusions, and tables and figures. The final group project/presentation grade is weighted, consisting of individual student contribution (per student contribution indicated in the written report) and a group project evaluation by the instructor (80%) and the student/peer evaluation (20%). Statistical computing midterm examinations #1 and #2 (in-class) Theory midterm examinations (take-home and in-class) Final examinations (theory and statistical computing)
	BST 625: Statistical Computing	Group project and presentation: Students will be guided to find a publicly available dataset and, using the knowledge learned in the class, generate a research question, explore the dataset and test the research question. The groups (2-3 students) will prepare a 4 to 6-minute presentation introducing their question or hypothesis, briefly explain any interesting or novel code used, answer the question or hypothesis, and present a corresponding figure showing the result or motivating the hypothesis. Each student in the group will

		answer direct questions from the instructor during the presentation. Evaluation is completed by the instructor for each group, and individual student, with a presentation rubric.
9. Gain successful practical experience in statistical consulting, including interaction with research faculty in the health sciences	BST 610: Introduction to Statistical Collaboration	Consultation report and presentation Students complete a consult with a faculty investigator with a clinical and translational research question from the University of Miami Clinical and Translational (CTSI) research community. The faculty investigator presents their research idea and problem in detail to the class and students are required to communicate with the investigator to understand the research question and objectives. Students have a short period of time after the initial consultation to follow-up with the investigator, and address questions they may have related to the research. Student teams are then required to complete a consultation written report summarizing the scientific question of interest, provide endpoints and hypotheses, outline methods to be utilized, provide a study design, detail a statistical approach, and further considerations (issues that may arise in the investigation and outline steps to move forward). Student teams create a presentation and present their consultation report to the class, the instructor, and the CTSI faculty investigator for evaluation and feedback. Each student on the team will answer direct questions from the faculty instructor and the faculty investigator during the presentation. Evaluation is completed by the instructor for each team, and individual student, based on presentation performance and the written report.

Assessment of Competencies for MS in Climate and Health		
Content	**Course number(s) or other educational requirements**	**Specific assessment opportunity**
1. Explain physical processes that control global and regional climate, and global and regional weather patterns and extreme weather patterns	ATM 614: Introduction to Weather and Climate	Exam #1 and exam #2 Weekly homework assignments
2. Explain interplay between health and C^2W^2, the burden of disease/disability in different communities and populations associated with weather and climate, and weather and climate-mediated changes in the environment	EPH 646: Climate and Health	Quiz #1 Final examination
3. Examine bio-physiological responses with respect to short- and long-term climate changes and weather patterns	EPH 657: Toxicology, Climate and Health	Final examination Laboratory experiments and notebook reports: Each student completes five experiments (in-vitro and in-vivo) and produces a laboratory report for each experiment. Laboratory experiment topics include: effects of changing pH on cell death, effects of heavy metals on pond organisms, effects of environmental pollution on cells, effects of temperature on cell death, and effects of temperature on cell death signaling.
4. Develop skills in collecting, managing and analyzing health, climate and associated data sets to quantify the health effects of climate incorporating hierarchical (including individual, community and region-specific) socio-physical environmental characteristics	EPH 727: Climate, Environment and Health: Data Integration and Management	Research paper reviews: Six assignments (select research papers assigned by the instructor) where students write a critical review of the methods and data used, reliability of the research design and types and sources of the data, potential challenges and/or problems in the integration/collection of multiple data sets, and credibility of the research findings of the paper in light of the data and methodology used. Laboratory assignments: Six dedicated laboratory sessions; to develop skills in acquiring, collecting, analyzing climate/weather, and health and health related data sets, needed data and related material, including

		scripts and customized programs. Class project: Students select a topic concerning the linkages between health and climate change/weather anomalies/extreme weather. Requirements include acquiring data sets, resolving mismatch in the scales of the data, assessing errors and/or uncertainty in the integration of the data sets, interpreting and presenting the data.
5. Explain the structure and administration of public health organizations and the policies that impact health programs and health services for different communities	EPH 646: Climate and Health	Quiz #1 and #3 Final examination
	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination
6. Identify direct and indirect roles of different stakeholders in the surveillance and management of the health effects of climate	EPH 646: Climate and Health	Quiz #3 Student team project Opinion paper Final examination
7. Assess disparities in the health effects of climate and extreme weather	EPH 646: Climate and Health	Opinion paper Final examination

Assessment of Competencies for MS in Prevention Science and Community Health		
Content	**Course number(s) or other educational requirements**	**Specific assessment opportunity**
1. Apply epidemiologic methods to the measurement and study of prevention science	EPH 623: Determinants of Health and Health Disparities Across the Life Course	Paper #1: Health inequities, social determinants of health, and GIS mapping. Describe an existing public health problem for which an inequity exists, describe the inequity using epidemiologic statistics and public health terms, and present their ArcGIS analyses map that helps visualize the geographic distribution of the health problem and social determinants of health.
	EPH 617: Introduction to Disease Prevention and Health Promotion	Midterm examination Final examination Students are tested on the different types and ways risk and protective factors can be conceptualized, measured, scored and used in prevention science

		(e.g., in the calculation of prevalence rates of elevated risk and in the use of Rose's theorem in the prevention paradox).
2. Describe the origins, foundations, and standards of prevention science	EPH 617: Introduction to Disease Prevention and Health Promotion	Midterm examination Final examination Students are tested on the definitions of prevention science and preventive medicine, the tenets of prevention science (e.g., life-course perspective, interdisciplinary nature, psycho-social ecology, spectrum of intervention), the origins of prevention science (e.g., developmental epidemiology), its foundations (risk and protective factor paradigm), standards of efficacy and effectiveness of preventive science and related interventions (e.g., evidence-based program registries).
3. Design and carry out theoretically-grounded research studies that contribute to the literature on risk and protective factors, and identify their mechanisms of influence associated with health and behavior outcomes across the lifespan	EPH 717: Integrating Behavior Health Theories and Models	Midterm examination Final paper and presentation: Develop a final paper that examines a clearly defined research question through two distinct theoretical lenses. Primary objective is to compare and contrast the utility of two distinct theoretical approaches for examining the question. Components include-- ▪ overview of the problem and its public health significance ▪ identification of a research question(s) and testable hypotheses ▪ compare and contrast two theories that inform refinement of the research question ▪ identification of theory-based moderators and mediators with a conceptual model ▪ summary and conclusions
	EPH 623: Determinants of Health and Health Disparities Across the Life Course	Paper #1: Health inequities, social determinants of health, and GIS mapping.

		Describe an existing public health problem for which an inequity exists, describe the inequity using epidemiologic statistics and public health terms, and present their ArcGIS analyses map that helps visualize the geographic distribution of the health problem and social determinants of health. Paper #2: Using Ecological and Life Course Models to Analyze and Understand Determinants of Health. Continue to work on the topic from Paper #1 and write a paper that provides a comprehensive review of the determinants (i.e., risk and protective factors) of the public health problem, framing the paper using Ecological and Life Course Models. A thorough search and review of the peer-reviewed literature includes addressing determinants at different levels--individual, biological/genetic, behavioral/psychological, social, economic, community, environmental, cultural, policy and political factors--as well as global and globalization factors affecting the problem. Oral presentation of papers #1 and #2
4. Explain evidence-based preventive interventions and how to apply prevention science theories to the design, implementation, adaption and evaluation of preventive interventions	EPH 731: Developing, Adapting and Evaluating Interventions	Independent written reflection assignments: (1) explain what makes an intervention "evidence based," (2) describe an example of the use of intervention mapping (for developing or adapting interventions) in a published article, (3) describe an example of the use of ADAPT-ITT (for adapting interventions) in a published article, and (4) identify an example of scientific inequity related to prevention interventions. In-class presentations: Individual presentations that guide students' development of knowledge/skills in applying theory to developing an intervention; students are required to complete presentations on: (1)

		their theoretical foundation for their planned prevention intervention, (2) their logic model for their prevention intervention, and (3) evidence-based behavior change techniques that they plan to use for their prevention intervention.
5. Integrate knowledge of research design, quantitative and qualitative methods, data analysis, and multi-method, multi-agent assessment methods commonly used in prevention science into research activities	EPH 617: Introduction to Disease Prevention and Health Promotion	Midterm examination Final examination Students are assessed on their knowledge of research designs (e.g., non-experimental, quasi-experimental) and methods both quantitatively (e.g., descriptive, correlational, economic) and qualitatively (e.g., ethnography, focus groups, case reviews) as they relate to various assessments of the efficacy, effectiveness and scale-ability of preventive interventions; and tests of mediation and moderation of risk/protective factors as shown in logic models and theories of change.
	EPH 698 and EPH 699: Thesis Proposal and Thesis	Thesis: This competency is addressed through the written submission and oral defense of the original research thesis.
6. Communicate research findings and conclusions (written and oral) in a clear and concise manner	EPH 717: Integrating Behavior Health Theories and Models	Final paper and presentation: Develop a final paper that examines a clearly defined research question through two distinct theoretical lenses. Primary objective is to compare and contrast the utility of two distinct theoretical approaches for examining the question. Components include-- ▪ overview of the problem and its public health significance ▪ identification of a research question(s) and testable hypotheses ▪ compare and contrast two theories that inform refinement of the research question ▪ identification of theory-based moderators and mediators with a conceptual model ▪ summary and conclusions

	EPH 698 and EPH 699: Thesis Proposal and Thesis	Thesis: This competency is addressed through the written submission and oral defense of the original research thesis.
7. Describe the importance of diversity and contextual issues such as culture, identity, ethnicity, gender, sexual orientation, disability, marginalization, poverty, inequity and religion in research and applied activities	EPH 623: Determinants of Health and Health Disparities Across the Life Course	Paper #1: Health inequities, social determinants of health, and GIS mapping. Describe an existing public health problem for which an inequity exists, describe the inequity using epidemiologic statistics and public health terms, and present their ArcGIS analyses map that helps visualize the geographic distribution of the health problem and social determinants of health. Paper #2: Using Ecological and Life Course Models to Analyze and Understand Determinants of Health. Continue to work on the topic from Paper #1 and write a paper that provides a comprehensive review of the determinants (i.e., risk and protective factors) of the public health problem, framing the paper using Ecological and Life Course Models. A thorough search and review of the peer-reviewed literature includes addressing determinants at different levels--individual, biological/genetic, behavioral/psychological, social, economic, community, environmental, cultural, policy and political factors--as well as global and globalization factors affecting the problem. Oral presentation of papers #1 and #2

Assessment of Competencies for MS in Public Health (MSPH)		
Content	**Course number(s) or other educational requirements**	**Specific assessment opportunity**
1. Apply epidemiologic methods to the measurement and study of population health and the prevention of infectious and chronic disease	EPH 621: Fundamentals of Epidemiology	Quiz #1 and quiz #3 Midterm examination and final examination
	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination
2. Explain the role of multi-level occupational and environmental conditions which directly or indirectly impact the health of individuals, communities and populations	EPH 641: Integrated Aspects of Environmental Health	Group class project (written report) and oral presentation (direct and indirect health implications of environmental conditions and exposures) ▪ Literature review and significance of selected environmental condition ▪ Conceptual framework—identify targeted individuals or communities at risk of adverse exposure ▪ Critique existing strategies to reduce exposure and provide recommendations to mitigate and manage adverse health effects Students indicate their percent contribution on an evaluation rubric for the group class project (written report and presentation) and this is considered by the faculty instructor when assigning a final grade per student.
	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination
3. Examine the main components and issues of the organization, financing and delivery of health services and public health systems	EPH 631: Public Health Administration	US/International Healthcare Comparison Paper—students will submit a one-page summary comparing and contrasting an international healthcare system of their choice (e.g., Canada, United Kingdom, Germany, Japan, Saudi Arabia, Austria) with the US healthcare system on the following: healthcare quality and access, emergency department use, hospital admissions for key diseases (e.g. CHF, diabetes, etc.), disability adjusted life years

		(DALY) and other relevant parameters. Midterm examination
	EPH 632: US Health Systems	Assignment #1 US/International healthcare comparison paper—students will submit a 1,200 to 1,500-word paper comparing and contrasting key characteristics between US, UK, Canadian and Japanese health systems. Compare and contrast essay with at least 4 of the following key characteristics: cultural values and beliefs underlying each system (access to care); differences in access to care between children (under 15 years old) and seniors (over age 70); payment systems/incentives; emergency room care; hospital admissions; disability adjusted life years (DALY); life expectancy and pharmaceuticals/drug coverage.
4. Apply statistical reasoning and quantitative methods for the purpose of analyzing public health data in population-based research	EPH 601: Medical Biostatistics I	Theory midterm examinations (in-class and take-home) Theory final examinations (in-class and take-home) Statistical computing midterm and final examinations Group project and report
	EPH 602: Medical Biostatistics II	Homework assignments, final examination and take-home data analysis project
5. Identify social and behavioral concepts, models and theories that form the foundation of health promotion and disease prevention	EPH 617: Introduction to Disease Prevention and Health Promotion	Midterm examination Final examination
	EPH 620: Health Education and Behavior	Assignment #1—community needs and asset assessment paper Assignment #2—determinants of health and preventive interventions paper
6. Differentiate between qualitative and quantitative evaluation methods in relation to their strengths, limitations and appropriate uses	EPH 644: Fundamentals of Program Evaluation	Quiz #1 and practice assessment 7.1 Evaluation plan interim assignments (evaluation plan methods grid—group assignment; and program evaluation critique—individual student assignment)

	EPH 656: Qualitative Research Methods	Qualitative study project (methods and results section assignment)
	EPH 651: Research Methods	Final examination
7. Identify public health research questions and hypotheses, analyze data and communicate research findings and conclusions in a clear and concise manner	EPH 698 and EPH 699: Thesis Proposal and Thesis	Thesis: This competency is addressed through the written submission and oral defense of the original research thesis.
	EPH 651: Research Methods	Final grant application
	EPH 604: Clinical Trials	Individual assignment 2.1: Individual proposal for a randomized clinical trial, through the formulation of a research question and designing for a RCT. Individual assignment 4.1: Presentation to peers on the proposed randomized clinical trial. Students are given guidelines on how to present to a body of scientific peers that will evaluate the merit of their research proposal.
8. Assess the strengths and limitations of various research designs in collecting, analyzing and interpreting information from public health studies	EPH 621: Fundamentals of Epidemiology	EPI topic group presentation (interpretation and critical appraisal of epidemiology sub-specialty research) Midterm examination and final examination
	EPH 651: Research Methods	Final examination

4) Identify required coursework and other experiences that address the variety of public health research methods employed in the context of a population health framework to foster discovery and translation of public health knowledge and a brief narrative that explains how the instruction and assessment is equivalent to that typically associated with a three-semester-credit course.

Typically, the school or program will present a separate list and explanation for each degree program, but these may be combined if requirements are identical.
(self-study document)

Each master's program curriculum requires students to address a variety of public health research methods. The courses listed below focus on research methods employed in the context of a population health framework to foster discovery and translation of public health knowledge in each discipline.

University of Miami courses offered during a typical semester must be equivalent to at least three hours per week per credit hour through a combination of scheduled contact and independent student effort. The course titles listed below require approximately 45 hours of study, which is equivalent to the instruction and assessment time typically associated with a three-credit semester course.

Biostatistics

Course Number	Course Title	Credits
EPH 621	Fundamentals of Epidemiology	3
EPH 703	Advanced Statistical Methods I	4
EPH 705	Advanced Statistical Methods II	3
BST 610	Introduction to Statistical Collaboration	3
BST 692	Data Science and Machine Learning for Health Research	3

Climate and Health

Course Number	Course Title	Credits
EPH 633	Policies and Management of the Health Effects of Climate	3
EPH 727	Climate, Environment and Health: Data Integration and Management	3
EPH 729	Analysis of the Health Effects of Climate	3
EPH 698	Thesis Proposal	3
EPH 699	Thesis	3

Prevention Science and Community Health

Course Number	Course Title	Credits
EPH 717	Integrating Behavioral Health Theories and Models into Prevention Science	3
EPH 731	Designing and Adapting Preventive Interventions	3
EPH 732	Introduction to Dissemination and Implementation Science	3
	Statistics/Research Methods	6
EPH 698	Thesis Proposal	3
EPH 699	Thesis	3

Public Health

Course Number	Course Title	Credits
EPH 601	Medical Biostatistics I	4
EPH 602	Medical Biostatistics II	3
EPH 621	Fundamentals of Epidemiology	3
	Research Methodology /Quantitative Analysis (two methods courses required) • EPH 651 Research Methods • EPH 604 Clinical Trials • EPH 656 Qualitative Research Methods • EPH 644 Fundamentals of Program Evaluation • EPH 703 Advanced Statistical Methods I	6
EPH 698	Thesis Proposal	3
EPH 699	Thesis	3

5) Briefly summarize policies and procedures relating to production and assessment of the final research project or paper. (self-study document)

The Graduate Programs academic master's degrees in climate and health, prevention science and community health and public health (MS CLIM, MS PREV and MSPH) require a research thesis and oral defense as the final research project. The thesis is a written report of each student's independent and original research. The MS in Biostatistics degree program requires two final research projects, part of course requirements for *BST 610 Introduction to Statistical Collaboration* and *BST 692 Data Science and Machine Learning for Health Research*.

Thesis

The MS degrees in climate and health, prevention science and community health and public health require a public health thesis consisting of two 3-credit courses, EPH 698 (thesis proposal) and EPH 699 (thesis). The purpose of the thesis is for students to demonstrate competency in the identification and study of a public health problem, program, or research question. After successfully completing the required course credits (minimum of 9 credits in core coursework and the required methodology courses), the student consults with their faculty advisor to select a thesis topic and form the thesis committee. University policy requires a minimum of three thesis committee members—two of which must hold a graduate faculty appointment, the third member serves as an outside member. The student develops a thesis proposal (EPH 698), which demonstrates to the thesis committee that the student understands how to conduct the proposed research and includes a detailed plan for accomplishing the work. The traditional thesis format, which provides an in-depth analysis of a particular research issue, typically follows the structure of abstract, introduction (background/literature review), materials and methods, results, discussion, references, and tables/figures and appendices (if applicable).

The completed thesis is submitted to and approved by the thesis committee before the student formally sets and announces an oral defense date. Master's thesis defenses are advertised by the Graduate School and by the Graduate Programs in Public Health. The thesis defense consists of a public oral presentation by the student summarizing the content of the written thesis. Anyone present during the public presentation may ask the student questions about their thesis research. However, following the public presentation, the thesis committee will conduct a private oral examination by asking the student to respond to committee questions. After temporarily dismissing the student for committee deliberations, the committee will vote, by majority, to assign a passing or failing grade. The committee will then recall the student to communicate the committee's findings and discuss any revisions necessary to the final product before the submission deadline to the Graduate School. The thesis committee will sign a certificate of defense form approving the final version of the written thesis and successful completion of the oral defense. The student is responsible for submitting all Graduate School ETD forms and documents by the stated Graduate School deadline**.**

Research Projects

The MS Biostatistics students complete two courses their final semester (summer), *BST 692 Data Science and Machine Learning for Health Research* and *BST 610 Introduction to Statistical Collaboration*. Projects from these two courses serve as the final research project/paper for the degree. In BST 692, students study and apply new data acquisition, data processing and machine learning methods. Students complete a series of 14 assignments assembling a complete data science pipeline. The individual assignments (completed in student teams) culminate into an interactive web application, which describes and predicts a real-world health outcome (e.g., survival after a catastrophic burn, presentation with late-stage breast cancer) using traditional statistical techniques and machine learning methods. Each student team provides a live online demonstration of their web application for both the class and clinical investigators. Student teams complete the series of 14 assignments and live online demonstration using GitHub, an online platform designed for collaborative code development. This system tracks and tags each individual student contribution to every assignment and the faculty instructor can track and evaluate progress for each individual student. For the team live-online demonstration of the web application, each student on the team answers direct questions from the faculty instructor during the presentation, and

students complete an individual oral examination session with the faculty instructor after the conclusion of all team presentations.

In BST 610, students complete a consult with a faculty investigator with a clinical and translational research question from the University of Miami Clinical and Translational (CTSI) research community. The faculty investigator presents their research idea and problem in detail to the class and students are required to communicate with the investigator to understand the research question and objectives. Students have a short period of time after the initial consultation to follow-up with the investigator, and address questions they may have related to the research. Student teams are then required to complete a consultation written report summarizing the scientific question of interest, provide endpoints and hypotheses, outline methods to be utilized, provide a study design, detail a statistical approach, and further considerations (issues that may arise in the investigation and outline steps to move forward). Student teams create a presentation and present their consultation report to the class and the CTSI faculty investigator for evaluation and feedback. Each student on the team answers direct questions from the faculty instructor and the faculty investigator during the presentation. Evaluation is completed by the instructor for each team, and individual student, based on presentation performance and the written report.

6) Provide links to handbooks or webpages that contain the full list of policies and procedures governing production and assessment of the final research project or paper for each degree program. (electronic resource file)

The production and assessment of the final research paper (thesis) is outlined in the Graduate Program's thesis handbook and outlined on the Graduate School website, Electronic Theses and Dissertations (ETD). The research projects required for the MS Biostatistics degree (BST 610 and BST 692) are outlined in the course syllabi, which are available in the electronic resource files:

- ERF D17.6.1 MS Thesis Handbook (MS CLIM, MS PREV and MSPH) and the Graduate School ETD Formatting Guidelines
- ERF D17.6.2 Course syllabi for *BST 610 Introduction to Statistical Consulting* and *BST 692 Data Science and Machine Learning for Health Research*

7) Include completed, graded samples of deliverables associated with the major paper or project. The school or program must provide at least 10% of the number produced in the last three years, or five examples, whichever is greater. (electronic resource file)

Sample deliverables associated with the major paper (thesis) or research projects are available in the electronic resource files:

- ERF D17.7.1 MS in Biostatistics research projects
- ERF D17.7.2 MS in Prevention Science and Community Health thesis
- ERF D17.7.3 MS in Public Health thesis

The MS Climate and Health program began in Fall 2020 and students have not reached the thesis stage of the program.

8) Briefly explain how the school or program ensures that the instruction and assessment in basic public health knowledge is generally equivalent to the instruction and assessment typically associated with a three-semester-credit course. (self-study document)

MS students obtain instruction on basic public health knowledge through the required three-credit semester course *EPH 600 Introduction to the Science and Practice of Public Health*. The course is offered in fall and spring semesters each academic year. Assessment of basic public health knowledge and the foundational public health learning objectives are made through examinations (midterm and final), quizzes, written assignments and class presentations.

University of Miami courses offered during a typical semester must be equivalent to at least three hours per week per credit hour through a combination of scheduled contact and independent student effort. EPH 600 requires approximately 45 hours of study, which is equivalent to the instruction and assessment time typically associated with a three-credit semester course.

9) Include the most recent syllabus for any course listed in the documentation requests above, or written guidelines for any required elements that do not have a syllabus. (electronic resource file)

Syllabi for the MS programs are available as electronic resource files, as indicated below.

- ERF D17.9.1 Syllabi for the MS in Biostatistics
- ERF D17.9.2 Syllabi for the MS in Prevention Science and Community Health
- ERF D17.9.3 Syllabi for the MS Climate and Health
- ERF D17.9.4 Syllabi for the MS in Public Health

10) If applicable, assess strengths and weaknesses related to this criterion and plans for improvement in this area. (self-study document)

Strengths: The Graduate Programs academic master's degrees are well established. Students complete a curriculum in each degree that is based on defined competencies and covers scientific and analytic approaches to discovery and translation of public health knowledge. Each degree program includes instruction in foundational public health knowledge, and includes a thesis or final research project.

Weaknesses: Enrollment in the academic master's programs is small and can vary year to year.

Plans for Improvement: The biostatistics, climate and health, and prevention science and community health degree programs have each recently launched financial scholarship opportunities to attract a larger admission cohort.

D18. Academic Public Health Doctoral Degrees (SPH and PHP, if applicable)

Students enrolled in the unit of accreditation's doctoral degree programs that are designed to prepare public health researchers and scholars (e.g., PhD, ScD) complete a curriculum that is based on defined competencies; engage in research appropriate to the degree program; and produce an appropriately advanced research project at or near the end of the program of study.

These students also complete coursework and other experiences, outside of the major paper or project, that substantively address scientific and analytic approaches to discovery and translation of public health knowledge in the context of a population health framework.

These students complete doctoral-level, advanced coursework and other experiences that distinguish the program of study from a master's degree in the same field. The program defines appropriate policies for advancement to candidacy, within the context of the institution.

Finally, students complete coursework that provides instruction in the foundational public health knowledge at an appropriate level of complexity. This instruction may be delivered through online, in-person or blended methodologies, but it must meet the following requirements while covering the defined content areas.

- **The instruction includes assessment opportunities, appropriate to the degree level, that allow faculty to assess students' attainment of the introductory public health learning objectives. Assessment opportunities may include tests, writing assignments, presentations, group projects, etc.**

- **The instruction and assessment of students' foundational public health knowledge are equivalent in depth to the instruction and assessment that would typically be associated with a three-semester-credit class, regardless of the number of credits awarded for the experience or the mode of delivery.**

The program identifies at least one required assessment activity for each of the following foundational public health learning objectives.

Profession and Science of Public Health

1. **Explain public health history, philosophy and values**
2. **Identify the core functions of public health and the 10 Essential Services**
3. **Explain the role of quantitative and qualitative methods and sciences in describing and assessing a population's health**
4. **List major causes and trends of morbidity and mortality in the US or other community relevant to the school or program**
5. **Discuss the science of primary, secondary and tertiary prevention in population health, including health promotion, screening, etc.**
6. **Explain the critical importance of evidence in advancing public health knowledge**

Factors Related to Human Health

7. **Explain effects of environmental factors on a population's health**
8. **Explain biological and genetic factors that affect a population's health**
9. **Explain behavioral and psychological factors that affect a population's health**
10. **Explain the social, political and economic determinants of health and how they contribute to population health and health inequities**
11. **Explain how globalization affects global burdens of disease**
12. **Explain an ecological perspective on the connections among human health, animal health and ecosystem health (e.g., One Health)**

The school or program validates academic public health doctoral students' foundational public health knowledge through appropriate methods, which may include the following:

- **The school or program verifies students' previous completion of a CEPH-accredited degree (bachelor's, master's or doctoral degree)**
- **The school or program implements a test or other assessment tools that address the learning objectives listed above, or higher-level versions of the same objectives**
- **The school or program offers an online or in-person course, for credit or not-for-credit, that incorporates the learning objectives listed above, or higher-level versions of the same objectives**
- **The school or program includes the learning objectives listed above, or higher-level versions of the same objectives, in courses required of all academic public health doctoral students**

Required documentation:

1) List the curricular requirements for each non-DrPH public health doctoral degree in the unit of accreditation, EXCLUDING requirements associated with the final research project. The list must indicate (using shading) each required curricular element that a) is designed expressly for doctoral, rather than master's, students or b) would not typically be associated with completion of a master's degree in the same area of study.

The school or program may present accompanying narrative to provide context and information that aids reviewers' understanding of the ways in which doctoral study is distinguished from master's-level study. This narrative is especially important for institutions that do not formally distinguish master's-level courses from doctoral-level courses. The school or program will present a separate list for each degree program and concentration as appropriate. (self-study document)

The Graduate Programs in Public Health offers doctoral degrees in biostatistics, epidemiology, and prevention science and community health, which comprise both formal classroom instruction and guided research with faculty mentors. The PhD degree is awarded by the Graduate School. All PhD degrees require a minimum of 60 credit hours.

<u>Biostatistics PhD Degree</u>

The doctoral program in Biostatistics is an advanced, research-oriented degree program training students at the highest level in terms of theory and practice of biostatistics. The core curriculum includes a solid foundation of coursework in advanced statistical methods and statistical theory. Students are expected to complete a full suite of courses including several iterations of the seminar course, a consulting practicum and a series of elective coursework (cognate area) that ensures the candidate has studied a subject matter discipline within biomedical research. To advance to candidacy, students are required to pass a diagnostic examination at the conclusion of their first year of study and pass a qualifying examination (dissertation prospectus) at the conclusion of their third year of study. The curriculum culminates in the development and completion of a doctoral dissertation generating new knowledge in the field of biostatistics based on independent research.

The program consists of 37 credits of core coursework, 6 credits of foundational public health coursework, 12 credits of electives, and 12 credits of dissertation research for a total of 67 credits to complete the degree.

The curriculum provided in the following table assumes students enter the PhD program with a master's degree in statistics or biostatistics. Those students entering without a previous relevant master's degree can expect additional coursework to fulfill pre-requisites for taking PhD-level advanced coursework.

Course Number	Course Title	Credits
BST 603	Introduction to Probability Theory and its Applications	3
MTH 625	Introduction to Mathematical Statistics	3
MTH 642	Statistical Analysis	3
BST 610	Introduction to Statistical Collaboration	3
BST 630	Longitudinal and Multilevel Data	3
BST 640	Modern Numerical Multivariate Methods	3
BST 665	Design and Analysis of Clinical Trials	3
BST 676	Introduction to Generalized Linear Models (GLM)	3
BST 680	Advanced Statistical Theory	3
BST 690	Theory of Survival Analysis	3
BST 691	High Dimensional and Complex Data	3
EPH 600	Introduction to the Science and Practice of Public Health	3
EPH 621	Fundamentals of Epidemiology	3
BST 650	Topics in Biostatistics Seminar	1 (X 4 semesters)
	Electives (Cognate Area)	12
BST 830 and 840	Doctoral Dissertation (pre-candidacy and post-candidacy)	12

Courses indicated with light grey shading are PhD-specific required courses (higher level coursework) designed expressly for doctoral level study and not typically completed by master's level students. The MS in Biostatistics program offered by the Graduate Programs is a one-year program intended for quantitative students seeking training in applied biostatistics. The program emphasizes applications and understanding of statistical concepts rather than theoretical and mathematical principles.

Epidemiology PhD Degree

The doctoral program in Epidemiology is an intensive research-training program for students with prior training in public health or related disciplines. The program provides advanced education and training for students seeking a professional career in health-related research, as well as physicians and other persons who have attained professional degrees seeking to integrate epidemiological research and methods into their ongoing careers. As a research-focused degree, students are given the skills necessary to approach health problems to generate consequential research questions and use the most appropriate epidemiologic methods to address them. The PhD curriculum includes advanced coursework in epidemiologic theory, analytical and statistical methods, study design and data interpretation, ethics in research and research experience. In addition to the core courses, students have the opportunity to complete elective coursework in epidemiology and other disciplines relevant to their selected area of emphasis. To advance to candidacy, students are required to pass a comprehensive examination at the conclusion of their second year of study (in epidemiology and biostatistics). The curriculum culminates in the development and completion of a dissertation generating new knowledge in the field of epidemiology based on independent research.

The program consists of 37 credits of core coursework, 15 credits of electives and 12 credits for dissertation research for a total of 64 credits to complete the degree.

The curriculum provided in the following table assumes students enter the PhD program with a master's degree in public health. Those students entering without a previous relevant master's degree can expect additional coursework to fulfill pre-requisites for taking PhD-level advanced coursework.

Course Number	Course Title	Credits
BST 625	Statistical Computing	3
BST 630	Longitudinal and Multilevel Data	3
EPH 604	Clinical Trials	3
EPH 625	Ethics in Public Health	3
EPH 703	Advanced Statistical Methods I	4
EPH 705	Advanced Statistical Methods II	3
EPH 751	Survival Analysis in Clinical Trials	3
EPH 740	Basic Pathology and Pathophysiology	3
EPH 774	Epidemiologic Methods and Reasoning	3
EPH 776	Methods in Epidemiology	3
EPH 651 or EPH 752 or EPH 772	Research Methods Advanced Research Methods Design and Implementation of Epidemiologic Studies	3
EPH 700	Professional Development Seminar	1 (X 3 semesters)
	Electives* *9 of the 15 elective credits must be epidemiology core electives o Molecular and Genetic Epidemiology o Infectious Disease Epidemiology o Cancer Epidemiology o Diabetes Epidemiology o Cardiovascular Disease Epidemiology o Chronic Disease Epidemiology o Environmental Epidemiology o Social Epidemiology	15
EPH 830 and 840	Doctoral Dissertation (pre-candidacy and post-candidacy)	12

Students entering the PhD program without an earned MPH, MSPH or equivalent accredited public health degree are required to complete EPH 600 Introduction to the Science and Practice of Public Health and EPH 621 Fundamentals of Epidemiology

Courses indicated with light grey shading are PhD-specific required courses (higher level coursework) designed for doctoral level study and not typically completed by master's level students (MPH or MSPH). The Graduate Programs does not offer a master's level degree in epidemiology.

Prevention Science and Community Health PhD Degree

The doctoral program in Prevention Science and Community Health provides students with the necessary expertise and interdisciplinary background to contribute to the 21st-century prevention and community health research. Students receive training in both traditional and innovative areas of prevention science, including etiology, intervention design and evaluation, innovative data collection and analyses, community-based participatory research, and implementation science. To advance to candidacy, students are required to pass a comprehensive examination (in prevention science and biostatistics) at the conclusion of their second year of study. The curriculum culminates in the development and completion of a dissertation generating new knowledge in the field of prevention science based on independent research.

The program consists of 46 credits of core coursework, 8 credits of seminar, 9 credits of electives and 12 credits for dissertation research for a total of 75 credits to complete the degree.

The curriculum provided in the following table assumes students enter the PhD program with a master's degree in public health or a related field. Those students entering without a previous relevant master's degree can expect additional coursework to fulfill pre-requisites for taking PhD-level advanced coursework.

Course Number	Course Title	Credits
EPH 604	Clinical Trials	3
EPH 617	Introduction to Disease Prevention and Health Promotion	3
EPH 623	Determinants of Health and Health Disparities Across the Life Course	3
EPH 626	Health Equity (currently substituting EPH 625 Ethics in Public Health)	3
EPS 622	Community Well-being and Change: Theory and Practice (currently substituting EPH 651 Research Methods)	3
EPH 647	Community Based Participatory Research and Social Network Analysis	3
EPH 703	Advanced Statistical Methods I	4
EPH 705	Advanced Statistical Methods II	3
EPH 717	Integrating Behavior Health Theories and Models	3
EPH 731	Developing, Adapting and Evaluating Interventions	3
EPH 732	Introduction to Dissemination and Implementation Science	3
EPH 752	Advanced Research Methods	3
EPS 708	Structural Equation Modeling	3
PSY 634	Multilevel Modeling (currently substituting BST 630 Longitudinal and Multilevel Data)	3
EPH 656	Qualitative Research Methods	3
EPH 700	Professional Development Seminar	1 (X 4 semesters)
EPH 701	Innovations in Prevention Science Methodology	1 (X 4 semesters)
	Electives	9
EPH 830 and 840	Doctoral Dissertation (pre-candidacy and post-candidacy)	12

Students entering the PhD program without an earned MPH, MSPH or equivalent accredited public health degree are required to complete EPH 600 Introduction to the Science and Practice of Public Health and EPH 621 Fundamentals of Epidemiology

Courses indicated with light grey shading are PhD-specific required courses (higher level coursework) designed for doctoral level study and not typically completed by master's level students. The MS in Prevention Science and Community Health program offered by the Graduate Programs is a 33-credit program providing students with training in the fundamentals of prevention science. The MS and PhD programs do share three course titles in prevention science (in theories, intervention development and dissemination/implementation science). The PhD curriculum blends introductory and advanced coursework providing both a broader exposure to different subject areas in prevention science and a more rigorous in-depth analysis of theory and statistical methods to facilitate advanced subject area research.

2) Provide a matrix, in the format of Template D18-1, that indicates the required assessment opportunities for each of the defined foundational public health learning objectives (1-12). Typically, the school or program will present a separate matrix for each degree program, but matrices may be combined if requirements are identical. (self-study document)

PhD students obtain a public health orientation to the 12 foundational learning objectives, primarily through the completion of two structured semester courses for credit (3 credits each), *EPH 600 Introduction to the Science and Practice of Public Health* and *EPH 621 Fundamentals of Epidemiology*. Assessment of the foundational competencies is made through examinations (midterm and final), quizzes, and written assignments.

Foundational public health knowledge is also validated through previous completion of a CEPH-accredited degree. Students entering the doctoral programs with an earned MPH, MSPH or other relevant CEPH-accredited public health degree are not required to complete EPH 600 or EPH 621 as part of their doctoral study.

Template D18-1.

Content Coverage for Academic Doctoral Degrees in Public Health (Biostatistics, Epidemiology and Prevention Science and Community Health)		
Content	**Course number(s) or other educational requirements**	**Specific assessment opportunity**
1. Explain public health history, philosophy and values	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination
2. Identify the core functions of public health and the 10 Essential Services	EPH 600: Introduction to the Science and Practice of Public Health	Final examination
3. Explain the role of quantitative and qualitative methods and sciences in describing and assessing a population's health	EPH 621: Fundamentals of Epidemiology	Quiz #1 Midterm examination
4. List major causes and trends of morbidity and mortality in the US or other community relevant to the school or program	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination
	EPH 621: Fundamentals of Epidemiology	Quiz #2 Midterm examination
5. Discuss the science of primary, secondary and tertiary prevention in population health including health promotion, screening, etc.	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination
	EPH 621: Fundamentals of Epidemiology	Homework assignment #1 and #12 Quiz #1 and #3 Final examination
6. Explain the critical importance of evidence in advancing public health knowledge	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination
	EPH 621: Fundamentals of Epidemiology	Quiz #3 EPI topic group presentation Final examination

7. Explain effects of environmental factors on a population's health	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination
	EPH 621: Fundamentals of Epidemiology	Homework assignment #1 Final examination
8. Explain biological and genetic factors that affect a population's health	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination
	EPH 621: Fundamentals of Epidemiology	Homework assignment #1 Midterm examination
9. Explain behavioral and psychological factors that affect a population's health	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination
	EPH 621: Fundamentals of Epidemiology	Homework assignment #1 Final examination
10. Explain the social, political and economic determinants of health and how they contribute to population health and health inequities	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination
	EPH 621: Fundamentals of Epidemiology	Midterm examination Final examination
11. Explain how globalization affects global burdens of disease	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination
	EPH 621: Fundamentals of Epidemiology	Quiz #1 Midterm examination
12. Explain an ecological perspective on the connections among human health, animal health and ecosystem health (e.g., One Health)	EPH 600: Introduction to the Science and Practice of Public Health	Midterm examination Final examination

3) Provide a matrix, in the format of Template D18-2, that lists competencies for each relevant degree and concentration. The matrix indicates at least one assessment activity for each of the listed competencies. Typically, the school or program will present a separate matrix for each concentration. Note: these competencies are defined by the school or program and are distinct from the introductory public health learning objectives defined in this criterion. (self-study document)

Template D18-2.

Assessment of Competencies for PhD in Biostatistics		
Concentration Competency	**Course number(s) and name(s)**	**Specific assessment opportunity**
1. Conduct original research on the theory and/or methodology of biostatistics	BST 691: High Dimensional and Complex Data	Midterm examination: Assessing mastery of the concept and theory of statistical learning, decision theory, linear discriminant analysis/quadratic discriminant analysis, model selection, cross validation, penalized regression, and variable selection. Final project: Students participate in an open prediction modeling challenge, a take-home data analysis project that assesses the mastery of statistical learning models for building effective prediction models for complex, high dimensional data, including variable selection, model selection, and result interpretation. Individual student evaluation includes the performance of the prediction model, the summary report, and the programming code used.
	BST 830 and 840: Doctoral Dissertation	Dissertation: As evidenced by the dissertation document and oral defense, demonstration of mastery through the development at the doctoral level of research examining theory and/or methodology of biostatistics that advance the field. Sample dissertation titles for innovative theory and/or methods include: ▪ Unsupervised random forests and target outcome relationship exploration ▪ New methods on classified mixed model prediction ▪ Conditional ROC curves for a paired case-control design ▪ Estimating individual treatment effect in observational data using random forest methods ▪ New methods for disparity estimation ▪ Random forest quantile classifier for class imbalanced data

2. Apply innovative theory and/or methods to scientific problems	BST 630: Longitudinal and Multilevel Data	Homework assignments: For each of the methods introduced in class, every student is responsible for specifying a model with pre-specified hypotheses, estimating that model (and testing the hypotheses) and writing a brief summary of results using the dataset provided. Final project and presentation: Students will prepare a longitudinal investigation illustrating their command of the methods presented throughout the course. The paper will include a brief introduction describing the project and the question or hypothesis to be answered/tested. A full methods and results section will describe the measures used, the methods employed and the results of the analysis. Provide a short and concise summary and conclusion of the importance and impact of the findings. Innovative theories and/or methods covered include: ▪ Covariance structure ▪ Mixed models ▪ Generalized estimating equations ▪ Generalized linear mixed modeling ▪ Conditional and marginal models induced by non-linearity ▪ Multivariate modeling of multiple stochastic processes over time ▪ Cluster trajectories over time ▪ Generalized growth mixture modeling ▪ Latent class analysis
	BST 640: Modern Numerical Multivariate Methods	Homework assignments: 6-7 assignments, a mixture of theory problems requiring analytical solutions and real data applications/case studies applying multivariate techniques implemented computationally using R computing language. Term project: In-depth modern statistical analysis with a multivariate data set; written report detailing a full description of the contents of the data,

		hypothesis, model, results from the model fit using R, and overall conclusion defending the analysis. Innovative theories and/or methods covered from a classical and modern perspective include: ▪ Convergence ▪ Multivariate normal distribution ▪ Bayesian multivariate normal model ▪ Cross-validation ▪ Prediction error ▪ Generalization error ▪ Penalization/regularization ▪ Lasso ▪ Oracle estimation ▪ Spectral decomposition ▪ Random survival forests ▪ Virtual twin casual inference ▪ Class-imbalance ▪ Trees, Bagging and Forests ▪ Newton's method ▪ Steepest descent ▪ Gradient boosting
	BST 830 and 840: Doctoral Dissertation	Dissertation: As evidenced by the dissertation document and oral defense, demonstration of mastery through the development at the doctoral level of research examining theory and/or methodology of biostatistics that advance the field. Sample dissertation titles for innovative theory and/or methods include: ▪ Unsupervised random forests and target outcome relationship exploration ▪ New methods on classified mixed model prediction ▪ Conditional ROC curves for a paired case-control design ▪ Estimating individual treatment effect in observational data using random forest methods ▪ New methods for disparity estimation ▪ Random forest quantile classifier for class imbalanced data

3. Apply appropriate advanced data analysis and management techniques to analyze epidemiologic data	BST 676: Introduction to Generalized Linear Models	Homework assignments: Questions about applying methods to population health datasets. Final examination (take-home): Analyzing a particular population health dataset using the most appropriate methods from the class (includes coding in R).
4. Communicate research findings and conclusions (written and oral) in a clear and concise manner	BST 630: Longitudinal and Multilevel Data	Homework assignments: For each of the methods introduced in class, every student is responsible for specifying a model with pre-specified hypotheses, estimating that model (and testing the hypotheses) and writing a brief summary of results using the dataset provided. Final project and presentation: Students will prepare a longitudinal investigation illustrating their command of the methods presented throughout the course. The paper will include a brief introduction describing the project and the question or hypothesis to be answered/tested. A full methods and results section will describe the measures used, the methods employed and the results of the analysis, and a short and concise summary and conclusion of the importance and impact of the findings.
5. Serve as an expect biostatistician on collaborative scientific teams	BST 610: Introduction to Statistical Collaboration	Consultation report and presentation: Students complete a consult with a faculty investigator with a clinical and translational research question from the UM Clinical and Translational (CTSI) research community. The faculty investigator presents their research idea and problem in detail to the class and students are required to communicate with the investigator to understand the research question and objectives. Students have a short period of time after the initial consultation to follow-up with the investigator, and address questions they may have related to the research. Student teams are then required to complete a consultation written report summarizing the scientific question of interest, provide endpoints and hypotheses, outline methods to be utilized, provide a study design, detail a statistical approach, and further

		considerations (issues that may arise in the investigation and outline steps to move forward). Student teams create a presentation and present their consultation report to the class, the instructor, and the CTSI faculty investigator for evaluation and feedback. Each student on the team will answer direct questions from the faculty instructor and the faculty investigator during the presentation. Evaluation is completed by the instructor for each team, and individual student, based on presentation performance and the written report.

Assessment of Competencies for PhD in Epidemiology		
Concentration Competency	**Course number(s) and name(s)**	**Specific assessment opportunity**
1. Design epidemiologic studies applying sound methodology and assess the validity of results	EPH 774: Epidemiologic Methods and Reasoning	Journal Article Critique final project (written evaluation and presentation): Students are required to critique a set of articles and prepare a written appraisal and oral presentation/discussion. Midterm examination and final examination
	EPH 776: Methods in Epidemiology	Preparation of a Scientific Manuscript for submission to a peer-reviewed journal: To demonstrate ability of formulating and answering a research question based on a real-life population dataset and demonstrate knowledge of epidemiology, in regards to population-based studies. Given the public availability of cancer population-based datasets, the study will be carried out on a cancer site of the student's choice. Suggested outcomes will include, but are not limited to, stage at diagnosis or survival in a context of racial-ethnic disparities. Execution of the manuscript will comprise (1) formulation of a research question, (2) literature review, (3) cleaning and

		preparation of the dataset including operational variables, (4) statistical analyses, (5) interpretation of results and (6) writing of the manuscript.
2. Develop data collection/management methods and tools needed for performing epidemiology investigations	EPH 703: Advanced Statistical Methods I	Group project and presentation: The objective is to use regression modeling techniques to determine predictors of length of hospital stay, which is defined by days between hospital discharge and hospital admission (myocardial infarction/heart attack study data). The written summary report includes abstract, introduction and background, methods, results, discussion, limitations and conclusions, and tables and figures. The final group project/presentation grade is weighted, consisting of individual student contribution (per student contribution indicated in the written report) and a group project evaluation by the instructor (80%) and the student/peer evaluation (20%). Statistical computing midterm examinations #1 and #2 (in-class) Theory midterm examinations (take-home and in-class) Final examinations (theory and statistical computing)
	BST 625: Statistical Computing	Group project and presentation: Students will be guided to find a publicly available dataset and, using the knowledge learned in the class, generate a research question, explore the dataset and test the research question. The groups (2-3 students) will prepare a 4 to 6-minute presentation introducing their question or hypothesis, briefly explain any interesting or novel code used, answer the question or hypothesis, and present a corresponding figure showing the result or motivating the hypothesis. Each student in the group will answer direct questions from the instructor

		during the presentation. Evaluation is completed by the instructor for each group, and individual student, with a presentation rubric.
	EPH 774: Epidemiologic Methods and Reasoning	Midterm examination and final examination
3. Utilize the application of statistical methods that are critical to epidemiologic inquiry, manage and manipulate data sets in statistical analysis software packages including SAS and R	EPH 703: Advanced Statistical Methods I	Statistical computing midterm examinations #1 and #2 (in-class) Theory midterm examinations (take-home and in-class) Final examinations (theory and statistical computing)
	EPH 705: Advanced Statistical Methods II	Weekly homework assignments Midterm examination and final examination
	EPH 751: Survival Analysis in Clinical Trials	Weekly assignments: Students submit reports of the ten assignments. Students learn how to implement the methods using SAS. The write-up report includes answers to specific questions, presentation of results in tables and plots, and interpretation of results. Midterm examination and final examination
4. Identify major chronic and infectious diseases, their general patho-physiology, descriptive epidemiology and risk factors	EPH 740: Basic Pathobiology	Quiz #1 and #2 Midterm examination and final examination
5. Critically evaluate scientific literature and synthesize the outcomes across studies, balancing limitations and contributions of each study	EPH 774: Epidemiologic Methods and Reasoning	Journal Article Critique final project (written evaluation and presentation): Students are required to critique a set of articles and prepare a written appraisal and oral presentation/discussion.
	EPH 776: Methods in Epidemiology	Final individual project: Each student will select a disease, injury, condition or illness to investigate and track. The project will entail providing background on the topic to be discussed, analyzing an epidemiological research article about the topic, designing a study, and critiquing another student's project.

6. Articulate research questions that advance scientific knowledge and develop a proposal for extramural research funding	EPH 776: Methods in Epidemiology	Preparation of a Scientific Manuscript for submission to a peer-reviewed journal: To demonstrate ability of formulating and answering a research question based on a real-life population dataset and demonstrate knowledge of epidemiology, in regards to population-based studies. Given the public availability of cancer population-based datasets, the study will be carried out on a cancer site of the student's choice. Suggested outcomes will include, but are not limited to, stage at diagnosis or survival in a context of racial-ethnic disparities. Execution of the manuscript will comprise (1) formulation of a research question, (2) literature review, (3) cleaning and preparation of the dataset including operational variables, (4) statistical analyses, (5) interpretation of results and (6) writing of the manuscript.
7. Effectively communicate (written and oral form) epidemiologic concepts to students and peers	EPH 774: Epidemiologic Methods and Reasoning	Journal Article Critique final project (written evaluation and presentation): Students are required to critique a set of articles and prepare a written appraisal and oral presentation/discussion.
	EPH 776: Methods in Epidemiology	Final individual project: Each student will select a disease, injury, condition or illness to investigate and track. The project will entail providing background on the topic to be discussed, analyzing an epidemiological research article about the topic, designing a study, and critiquing another student's project.
	EPH 830 and 840: Doctoral Dissertation	Dissertation: This competency is addressed through the written submission and oral defense of the original research doctoral dissertation.
8. Conduct an advanced original research project and demonstrate mastery of the topic area	EPH 776: Methods in Epidemiology	Preparation of a Scientific Manuscript for submission to a peer-reviewed journal: To demonstrate ability of formulating and answering a

		research question based on a real-life population dataset and demonstrate knowledge of epidemiology, in regards to population-based studies. Given the public availability of cancer population-based datasets, the study will be carried out on a cancer site of the student's choice. Suggested outcomes will include, but are not limited to, stage at diagnosis or survival in a context of racial-ethnic disparities. Execution of the manuscript will comprise (1) formulation of a research question, (2) literature review, (3) cleaning and preparation of the dataset including operational variables, (4) statistical analyses, (5) interpretation of results and (6) writing of the manuscript.
	EPH 830 and 840: Doctoral Dissertation	Dissertation: This competency is addressed through the written submission and oral defense of the original research doctoral dissertation.
9. Read, plan, develop and present epidemiologic data outside the area of mastery	Comprehensive Examinations	Students complete structured coursework their first two years of study and sit for the comprehensive examinations in epidemiology and biostatistics their second summer of enrollment. The Epidemiology portion of the comprehensive examinations includes an in-class and take-home examination. The take home examination is a grant proposal in a content area outside each student's area of research focus.
10. Conduct epidemiological research and be prepared to work collaboratively with scientists and practitioners in other fields	EPH 830 and 840: Doctoral Dissertation	Dissertation: This competency is addressed through the written submission and oral defense of the original research doctoral dissertation.
11. Convey epidemiology concepts to new learners of epidemiology	Teaching Assistant (TA) Requirement	Teaching Assistantship in a master's level epidemiology or methods course (full semester participation). The PhD student prepares and provides at least one full class lecture and offers small group tutoring in weekly office hours. TA and faculty instructor discuss plan/mode of delivery, content of lecture, learning objectives, possible exam

		questions, etc., pre-and post-lecture. Class lecture evaluation is provided by all students in class and by the instructor using a structured form post-lecture.
12. Recognize and identify the ethical issues relating to epidemiologic studies used in public health practice and/or research	EPH 774: Epidemiologic Methods and Reasoning	Journal Article Critique final project (written evaluation and presentation): Students are required to critique a set of articles and prepare a written appraisal and oral presentation/discussion.

Assessment of Competencies for PhD in Prevention Science and Community Health		
Concentration Competency	**Course number(s) and name(s)**	**Specific assessment opportunity**
1. Develop and implement data collection/management methods and tools needed for prevention science and community health research	EPH 703: Advanced Statistical Methods I	Group project and presentation: The objective is to use regression modeling techniques to determine predictors of length of hospital stay, which is defined by days between hospital discharge and hospital admission (myocardial infarction/heart attack study data). The written summary report includes abstract, introduction and background, methods, results, discussion, limitations and conclusions, and tables and figures. The final group project/presentation grade is weighted, consisting of individual student contribution (per student contribution indicated in the written report) and a group project evaluation by the instructor (80%) and the student/peer evaluation (20%). Statistical computing midterm examinations #1 and #2 (in-class) Theory midterm examinations (take-home and in-class) Final examinations (theory and statistical computing)
	EPH 647: Community-Based Participatory Research (CBPR) and Social Network Analysis	In-class activity #4 and written report: (1) Students will develop an egocentric digital network map using VennMaker, (2) Students will describe how to develop and

		change egocentric network attributes, and (3) students will describe how to use concentric circles and sectors inside egocentric networks. ▪ Develop a CBPR research question associated with their VennMaker egocentric digital network map ▪ Selection of non-relational and relational attributes ▪ Selection of concentric circles and sectors ▪ Develop the data collection instrument ▪ Data collection implementation ▪ Research findings including the visualization of network graphs ▪ Discussion and recommendations from a CBPR perspective Socio-centric network (CBPR) project and presentation (individual project and presentation) ▪ Focus/public health issue/research question ▪ Social network data ▪ Social network measures selection and instrument design ▪ Analytical approach ▪ Network design and implementation ▪ Data matrix and results section ▪ Discussion/community involvement
2. Apply epidemiologic methods to the measurement and study of population health and the prevention of infectious and chronic disease	EPH 752: Advanced Research Methods	Homework assignments (8) oriented around existing data sets and applying the research methods to the data utilizing M*plus*. Final examination (take-home exam consisting of a written essay on a research question or article chosen by the instructor that is relevant to a research design or method discussed in class).

		Student Project and Presentation: Presentation of students' projects constitutes a 15-minute presentation to the class noting research questions, sources of data, analytic method, results, and implications for the field. The project write-up consists of a 5 to 10-page written approach or methods section of a mock research grant proposal or manuscript suitable for publication in a high-quality peer-reviewed journal. The emphasis is on describing the research design, measures, participants, sampling design, and quantitative statistical methods of a research/evaluation grant proposal.
3. Articulate research questions that advance scientific knowledge and develop a proposal for extramural research funding	EPH 752: Advanced Research Methods	Final examination (take-home exam consisting of a written essay on a research question or article chosen by the instructor that is relevant to a research design or method discussed in class). Student Project and Presentation: Presentation of students' projects constitutes a 15-minute presentation to the class noting research questions, sources of data, analytic method, results, and implications for the field. The project write-up consists of a 5 to 10-page written approach or methods section of a mock research grant proposal or manuscript suitable for publication in a high-quality peer-reviewed journal. The emphasis is on describing the research design, measures, participants, sampling design, and quantitative statistical methods of a research/evaluation grant proposal.
4. Design and adapt a preventive intervention based on available etiological research	EPH 731: Developing, Adapting and Evaluating Interventions	Independent written reflection assignments: (1) explain what makes an intervention "evidence based," (2) describe an example of the use of intervention mapping (for developing or adapting interventions) in a published

		article, (3) describe an example of the use of ADAPT-ITT (for adapting interventions) in a published article, and (4) identify an example of scientific inequity related to prevention interventions. In-class presentations: Individual presentations that guide students' development of knowledge/skills in applying theory to developing an intervention; students are required to complete presentations on: (1) their theoretical foundation for their planned prevention intervention, (2) their logic model for their prevention intervention, and (3) evidence-based behavior change techniques that they plan to use for their prevention intervention. Final intervention presentation: Describe the theory behind their intervention, behavior change techniques, and overall consolidate their learning related to developing a prevention intervention. Students also develop competency in being critical/constructive consumers of this information via guided peer feedback exercises during the presentations (also part of the grading rubric). Interventional manual/final paper: Complete an intervention manual/final paper in which students lay at one fully functioning module of their prevention intervention. Students describe the theoretical foundations of the intervention, the logic model, the mechanisms of proposed effects, and anticipated outcomes.
5. Master principles of designing, conducting and analyzing data from a randomized clinical trial of a preventive intervention	EPH 604: Clinical Trials	Individual assignment 2.1: Individual proposal for a randomized clinical trial, through the formulation of a research question and designing for a RCT. Individual assignment 4.1: Presentation to peers on the proposed randomized clinical trial. Students are given guidelines on how to present to a body of

		scientific peers that will evaluate the merit of their research proposal. Individual assignment 6.1: Final examination includes multiple-choice questions assessing knowledge on design.
	EPH 705: Advanced Statistical Methods II	Weekly homework assignments Midterm examination and final examination
6. Master techniques for designing and carrying out procedures for translating evidence-based interventions to community practice	EPH 732: Introduction to Dissemination and Implementation Science	Project paper and presentation: Description of the implementation and/or dissemination of the preventive intervention chosen by the student for their in-class presentation. The emphasis of the project paper is on describing how an intervention would be implemented and/or disseminated in a particular setting (e.g., primary health care facilities) or domain (e.g., community, schools, workplace), consistent with one or more theoretical and operational models related to dissemination and implementation science. Final (take-home) examination
7. Apply state-of-the-science statistical methods and manage/manipulate datasets in statistical software such as SPSS, SAS, M*Plus* and R	EPH 703: Advanced Statistical Methods I	Statistical computing midterm examinations #1 and #2 (in-class) Theory midterm examinations (take-home and in-class) Final examinations (theory and statistical computing) Use of SAS is required
	EPH 701: Innovations in Prevention Science Methodology	Final take-home assignment: Students conduct a series of dyadic analyses using multilevel modeling and structural equation modeling approaches (research question and hypothesis, analysis technique, statistical output, and results tables, interpretation of coefficients and fi statistics). Use of SPSS and M*plus* is required.
8. Conduct prevention science research, and be prepared to work collaboratively with scientists and practitioners in other fields	EPH 830 and 840: Doctoral Dissertation	Dissertation: This competency is addressed through the written submission and oral defense of the original research doctoral dissertation.

4) Identify required coursework and other experiences that address the variety of public health research methods employed in the context of a population health framework to foster discovery and translation of public health knowledge and a brief narrative that explains how the instruction and assessment is equivalent to that typically associated with a three-semester-credit course.

Typically, the school or program will present a separate list and explanation for each degree program, but these may be combined if requirements are identical.
(self-study document)

Each doctoral program curriculum requires students to address a variety of public health research methods. The courses listed below focus on research methods employed in the context of a population health framework to foster discovery and translation of public health knowledge in each discipline.

University of Miami courses offered during a typical semester must be equivalent to at least three hours per week per credit hour through a combination of scheduled contact and independent student effort. The course titles listed below require approximately 45 hours of study, which is equivalent to the instruction and assessment time typically associated with a three-credit course.

Biostatistics

Course Number	Course Title	Credits
BST 610	Introduction to Statistical Collaboration	3
BST 630	Longitudinal and Multilevel Data	3
BST 640	Modern Numerical Multivariate Methods	3
BST 665	Design and Analysis of Clinical Trials	3
BST 676	Introduction to Generalized Linear Models (GLM)	3
BST 680	Advanced Statistical Theory	3
BST 690	Theory of Survival Analysis	3
BST 691	High Dimensional and Complex Data	3

Epidemiology

Course Number	Course Title	Credits
EPH 703	Advanced Statistical Methods I	4
EPH 705	Advanced Statistical Methods II	3
EPH 751	Survival Analysis in Clinical Trials	3
EPH 774	Epidemiologic Methods and Reasoning	3
EPH 776	Methods in Epidemiology	3
EPH 651 or EPH 752 or EPH 772	Research Methods Advanced Research Methods Design and Implementation of Epidemiologic Studies	3
EPH 700	Professional Development Seminar	1 (X 3 semesters)
	Electives* *9 of the 15 elective credits must be epidemiology core electives o Molecular and Genetic Epidemiology o Infectious Disease Epidemiology o Cancer Epidemiology o Diabetes Epidemiology	15

	○ Cardiovascular Disease Epidemiology ○ Chronic Disease Epidemiology ○ Environmental Epidemiology ○ Social Epidemiology	

Prevention Science and Community Health

Course Number	Course Title	Credits
EPH 647	Community Based Participatory Research and Social Network Analysis	3
EPH 703	Advanced Statistical Methods I	4
EPH 705	Advanced Statistical Methods II	3
EPH 717	Integrating Behavior Health Theories and Models	3
EPH 731	Developing, Adapting and Evaluating Interventions	3
EPH 732	Introduction to Dissemination and Implementation Science	3
EPH 752	Advanced Research Methods	3
PSY 633	Structural Equation Modeling	3
PSY 634	Multilevel Modeling (currently substituting BST 630 Longitudinal and Multilevel Data)	3
EPH 656	Qualitative Research Methods	3
EPH 701	Innovations in Prevention Science Methodology	1 (X 4 semesters)

5) Briefly summarize policies and procedures relating to production and assessment of the final research project or paper. (self-study document)

The Graduate Programs doctoral degrees require a doctoral dissertation and oral defense as the final research project. The doctoral dissertation is a written report of each student's independent and original research.

Biostatistics

To advance to candidacy, students are required to pass a diagnostic examination at the conclusion of their first year of study, and pass a qualifying examination (dissertation prospectus) at the conclusion of their third year of study. The qualifying exam is based on a prospectus of approximately 100 pages in university format describing the research topic that will form the student's dissertation. Overall understanding of the student's proposed research topic is embodied by this document. The student presents the prospectus during an oral qualifying examination, which is evaluated by an examination (dissertation) committee. Evaluation is based on the importance and novelty of the methodology and likelihood of publication of the result(s) in top journal(s). Committee members will evaluate the strength of the proposal based on the scope of the methodology and its relevance and importance to the literature.

Admission to candidacy must be completed via Dynamic Forms with the Graduate School to formally record passing of the qualifying examinations and file the working title of the dissertation and the composition of the dissertation committee. University policy requires a minimum of four dissertation committee members—three of whom must hold a graduate faculty appointment, the fourth member serves as an outside member/reader. The dissertation takes the form of three papers or one larger body of work that meets current standards of publication in peer-review journals. The dissertation consists of original research in the development of statistical methodology for biomedical or epidemiologic applications. It is expected that the dissertation content will address a relevant question in statistical methodology and will pose a new approach, extend an existing approach or provide novel application of

an existing method. The traditional dissertation format, which provides an in-depth analysis of a particular research issue, typically follows the chapter structure of abstract, introduction, methods, results, conclusion and references. The three-paper option format consists of the preparation of three manuscripts of publishable quality related to different issues within a common theme.

The completed dissertation, including abstract, introduction and conclusion, is submitted to and approved by the dissertation committee before the student formally sets and announces a defense date. Doctoral dissertation defenses are advertised by the Graduate School and by the Graduate Programs in Public Health. The dissertation defense consists of a public oral presentation by the student summarizing the content of the written dissertation. Anyone present during the public presentation may ask the student questions about their dissertation research. However, following the public presentation, the dissertation committee will conduct a private oral examination by asking the student to respond to committee questions. After temporarily dismissing the student for committee deliberations, the committee will vote, by majority, to assign a passing or failing grade. The committee will then recall the student to communicate the committee's findings and discuss any revisions necessary to the final product before the submission deadline to the Graduate School. The dissertation committee will sign a certificate of defense form approving the final version of the written dissertation and successful completion of the oral defense.

The student is responsible for submitting all Graduate School ETD forms and documents by the stated Graduate School deadline**.**

Epidemiology and Prevention Science and Community Health

After successfully completing the qualifying/comprehensive examinations, the student consults with their faculty mentor and program director to select a dissertation committee chair and forms the dissertation committee. Admission to candidacy must be completed via Dynamic Forms with the Graduate School to formally record passing of the qualifying/comprehensive examinations and file the working title of the dissertation and the composition of the dissertation committee. University policy requires a minimum of four dissertation committee members—three of whom must hold a graduate faculty appointment, the fourth member serves as an outside member/reader. The student develops a dissertation proposal, which demonstrates to the dissertation committee that the student understands how to conduct the proposed research and includes a detailed plan for accomplishing the work. The dissertation takes the form of three papers or one larger body of work that meets current standards of publication in peer-review journals. The traditional dissertation format, which provides an in-depth analysis of a particular research issue, typically follows the chapter structure of abstract, introduction, methods, results, conclusion and references. The three-paper option format consists of the preparation of three manuscripts of publishable quality related to different issues within a common theme.

The completed dissertation, including abstract, introduction, and conclusion, is submitted to and approved by the dissertation committee before the student formally sets and announces a defense date. Doctoral dissertation defenses are advertised by the Graduate School and by the Graduate Programs in Public Health. The dissertation defense consists of a public oral presentation by the student summarizing the content of the written dissertation. Anyone present during the public presentation may ask the student questions about their dissertation research. However, following the public presentation, the dissertation committee will conduct a private oral examination by asking the student to respond to committee questions. After temporarily dismissing the student for committee deliberations, the committee will vote, by majority, to assign a passing or failing grade. The committee will then recall the student to communicate the committee's findings and discuss any revisions necessary to the final product before the submission deadline to the Graduate School. The dissertation committee will sign a certificate of defense form approving the final version of the written dissertation and successful completion of the oral defense.

The student is responsible for submitting all Graduate School ETD forms and documents by the stated Graduate School deadline**.**

6) Provide links to handbooks or webpages that contain the full list of policies and procedures governing production and assessment of the final research project or paper for each degree program. (electronic resource file)

The production and assessment of the final research project (dissertation) is outlined in each program's degree handbook, and outlined on the Graduate School website, Electronic Theses and Dissertations (ETD), which are available in the electronic resource files:

- ERF D18.6 Handbooks for the PhD in Biostatistics, PhD in Epidemiology, PhD in Prevention Science and Community Health and Graduate School ETD Policies and Procedures and ETD Formatting

7) Include completed, graded samples of deliverables associated with the advanced research project. The school or program must provide at least 10% of the number produced in the last three years, or five examples, whichever is greater. (electronic resource file)

Sample deliverables associated with the advanced research project (dissertation) are available in the electronic resource files:

- ERF D18.7.1 PhD in Biostatistics dissertations
- ERF D18.7.2 PhD in Epidemiology dissertations
- ERF D18.7.3 PhD in Prevention Science and Community Health dissertations

8) Briefly explain how the school or program ensures that the instruction and assessment in introductory public health knowledge is generally equivalent to the instruction and assessment typically associated with a three semester-credit course. (self-study document)

PhD students obtain instruction on basic public health knowledge through the required three-credit semester course *EPH 600 Introduction to the Science and Practice of Public Health*. The course is offered in fall and spring semesters each academic year. Assessment of basic public health knowledge and the foundational public health learning objectives are made through examinations (midterm and final), quizzes, written assignments, and class presentations.

University of Miami courses offered during a typical semester must be equivalent to at least three hours per week per credit hour through a combination of scheduled contact and independent student effort. EPH 600 requires approximately 45 hours of study, which is equivalent to the instruction and assessment time typically associated with a three-credit course.

9) Include the most recent syllabus for any course listed in the documentation requests above, or written guidelines for any required elements that do not have a syllabus. (electronic resource file)

Syllabi for the PhD programs are available in the electronic resource files, as indicated below.

- ERF D18.9.1 Syllabi for the PhD in Biostatistics
- ERF D18.9.2 Syllabi for the PhD in Epidemiology
- ERF D18.9.3 Syllabi for the PhD in Prevention Science and Community Health

10) If applicable, assess strengths and weaknesses related to this criterion and plans for improvement in this area. (self-study document)

Strengths: The Graduate Programs doctoral degrees are well established and engage faculty at all stages of the program. Students enrolled in the PhD programs in Biostatistics, Epidemiology, and

Prevention Science and Community Health all complete curricula based on defined competencies, engage in research appropriate to their degree program, and produce a dissertation as a final advanced research project.

Weaknesses: Doctoral programming is a significant investment by the Graduate Programs and Department, which limits the number of students admitted each year.

Plans for Improvement: With additional financial and faculty resources, expand the admission cohort per degree program (from a 4-student admission cohort to a 5-student admission cohort per program per year). Continue to encourage and support qualified students to submit F30 and F31 grant applications (and other funded fellowship opportunities).

D19. All Remaining Degrees (SPH, if applicable)

This criterion is not applicable.

D20. Distance Education (SPH and PHP, if applicable)

This criterion is not applicable.