



College of Public Health

Competencies

Complete listing of foundational and concentration competencies

Professional Programs

- I. MPH Program Competencies
 - a. Foundational Competencies (all MPH students must meet)
 - b. Biostatistics
 - c. Epidemiology
 - d. Health Administration and Policy
 - e. Health Promotion Sciences
 - f. Health Promotion Sciences and Social Work
 - g. Interdisciplinary
 - h. Occupational and Environmental Health

- II. MHA Program Competencies

Graduate Programs

- III. Master of Science Program Competencies
 - a. Biostatistics
 - b. BS/MS in Biostatistics
 - c. Epidemiology
 - d. Health Promotion Sciences
 - e. Industrial Hygiene/Environmental Health Sciences

- IV. Doctor of Philosophy Program Competencies
 - a. Biostatistics
 - b. Epidemiology
 - c. Health Promotion Sciences
 - d. Occupational and Environmental Health

I. MPH Program Competencies

a. Foundational Competencies (all MPH students must meet)

Evidence-based Approaches to Public Health

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

Public Health & Health Care Systems

- FC 5 Compare the organization, structure and function of health care, public health and regulatory systems across national and international settings
- FC 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 & Management to Promote Health

- FC 7 Assess population needs, assets and capacities that affect communities' health
- FC 8 Apply awareness of cultural values and practices to the design or implementation of public health policies or programs
- FC 9 Design a population-based policy, program, project or intervention
- FC 10 Explain basic principles and tools of budget and resource management
- FC 11 Select methods to evaluate public health programs Policy in Public Health
- FC 12 Discuss multiple dimensions of the policy-making process, including the roles of ethics and evidence
- FC 13 Propose strategies to identify stakeholders and build coalitions and partnerships for influencing public health outcomes
- FC 14 Advocate for political, social or economic policies and programs that will improve health in diverse populations
- FC 15 Evaluate policies for their impact on public health and health equity

Leadership

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

Communication

- FC 18 Select communication strategies for different audiences and sectors
- FC 19 Communicate audience-appropriate public health content, both in writing and through oral presentation
- FC 20 Describe the importance of cultural competence in communicating public health content Interprofessional Practice
- FC 21 Perform effectively on Interprofessional teams

Systems Thinking

- FC 22 Apply systems thinking tools to a public health issue

b. Biostatistics MPH

BIOSTATISTICS

- Biostat 1 Use computer software for data entry and database management
- Biostat 2 Determine the most appropriate method of statistical analysis reflecting a given question of interest, the implemented study design and the available data, implementing preferred methodological alternatives to commonly used statistical methods when their assumptions are not met
- Biostat 3 Read the statistical methods reported in public health and medical literature and comment on their appropriateness to the study design and research questions
- Biostat 4 Compare and contrast advantages and disadvantages in the use of nonparametric or parametric statistical procedures, and in the use of univariate, bivariate and multivariable procedures

EPIDEMIOLOGY

- Epi 1 Identify, access, and integrate sources of health data such as vital statistics records, disease registries, national surveys, and medical records in order to address epidemiologic questions

- Epi 2 Describe the pathophysiology, natural history, and relative frequencies of health conditions that are major causes of morbidity and mortality
- Epi 3 Given an epidemiological investigation, compare and contrast strengths, limitations, and inference that may be drawn from data collected through the use of epidemiological research designs including cohort, case-control, ecologic, and cross-sectional studies
- Epi 4 Assess and explain strategies to summarize and report the impact of effect modification and to control for or minimize bias, including selection, information, and confounding bias on inference from epidemiologic studies

PUBLIC HEALTH PROFESSIONAL PRACTICE

Prof Biostat: Become an integral team member, as a junior analyst or research assistant, actively participating in identifying and formulating public health or biomedical questions, selecting appropriate study designs, identifying appropriate data collection and management methods, and selecting appropriate statistical analysis methods

c. Epidemiology MPH

BIOSTATISTICS

- Biostat 1 Use computer software for data entry and database management
- Biostat 2 Determine the most appropriate method of statistical analysis reflecting a given question of interest, the implemented study design and the available data, implementing preferred methodological alternatives to commonly used statistical methods when their assumptions are not met
- Biostat 3 Read the statistical methods reported in public health and medical literature and comment on their appropriateness to the study design and research questions

EPIDEMIOLOGY

- Epi 1 Identify, access, and integrate sources of health data such as vital statistics records, disease registries, national surveys, and medical records in order to address epidemiologic questions
- Epi 2 Describe the pathophysiology, natural history, and relative frequencies of health conditions that are major causes of morbidity and mortality
- Epi 3 Given an epidemiological investigation, compare and contrast strengths, limitations, and inference that may be drawn from data collected through the use of epidemiological research designs including cohort, case-control, ecologic, and cross-sectional studies

Epi 4

Assess and explain strategies to summarize and report the impact of effect modification and to control for or minimize bias, including selection, information, and confounding bias on inference from epidemiologic studies

PUBLIC HEALTH PROFESSIONAL PRACTICE

Prof Epi: Become an integral team member, as a junior epidemiologist or research assistant, actively participating in identifying public health or biomedical questions, selecting appropriate study designs, identifying appropriate data collection and management methods, and selecting appropriate statistical analysis methods to address the questions of interest

d. Health Administration and Policy MPH

- HAP 1 Develop and analyze financial statements including key ratios and indicators.
- HAP 2 Evaluate strengths and weaknesses of health care, public health, and regulatory systems across national and international settings.
- HAP 3 Apply principles of quality improvement including differentiating the relative advantages/disadvantages of measuring structure, process and outcomes.
- HAP 4 Apply economic concepts to predict stakeholder and market responses to economic incentives and governmental policies.
- HAP 5 Evaluate characteristics of effective health organization policies.

e. Health Promotion Sciences MPH

- HPS 1 Apply theories, concepts, and models from a range of social and behavioral disciplines that are used in public health research and practice
- HPS 2 Analyze individual, organizational, and community concerns, assets, resources and deficits for social and behavioral science interventions
- HPS 3 Apply ethical principles to public health program planning, implementation and evaluation
- HPS 4 Evaluate multiple targets and develop multiple levels of intervention for social and behavioral science programs and/or policies
- HPS 5 Apply basic concepts and skills involved in culturally appropriate community engagement and empowerment with diverse communities
- HPS 6 Demonstrate principles of community-based participatory research to improve health in diverse populations
- HPS 7 Differentiate among goals, measureable objectives, related activities, and expected outcomes for a public health program
- HPS 8 Differentiate the purposes of formative, process, and outcome evaluation

f. Health Promotion Sciences MPH and Social Work MSW

- HPS 1 Apply theories, concepts, and models from a range of social and behavioral disciplines that are used in public health research and practice
- HPS 2 Analyze individual, organizational, and community concerns, assets, resources and deficits for social and behavioral science interventions
- HPS 3 Apply ethical principles to public health program planning, implementation and evaluation
- HPS 4 Evaluate multiple targets and develop multiple levels of intervention for social and behavioral science programs and/or policies
- HPS 5 Apply basic concepts and skills involved in culturally appropriate community engagement and empowerment with diverse communities
- HPS 6 Demonstrate principles of community-based participatory research to improve health in diverse populations
- HPS 7 Differentiate among goals, measurable objectives, related activities, and expected outcomes for a public health program
- HPS 8 Differentiate the purposes of formative, process, and outcome evaluation

g. Interdisciplinary MPH

- IPH 1 Describe how US health policy is initiated, formulated and implemented, and discuss the associated influences of political culture, interest group and party behavior, the legislative and executive processes, and the interactions of states and the federal government
- IPH 2 Determine the most appropriate method of statistical analysis reflecting a given question of interest, the implemented study design and the available data, and apply generally available computer hardware and software to the analysis
- IPH 3 Apply theories, concepts, and models from a range of social and behavioral disciplines that are used in public health research and practice
- IPH 4 Analyze individual, organizational, and community concerns, assets, resources and deficits for social and behavioral science interventions
- IPH 5 Apply ethical principals to public health program planning, implementation and evaluation
- IPH 6 Describe the pathophysiology, natural history and relative frequencies of health conditions that are major causes of morbidity and mortality

h. Occupational and Environmental Health MPH

- EH 1 Apply environmental regulations and guidelines
- EH 2 Prescribe measures for control of pathogens in environmental media
- EH 3 Design programs to manage environmental hazards
- EH 4 Assess exposure to hazardous chemical and biological agents in the environment
- EH 5 Access and synthesize information on the toxic effects of chemicals
- EH 6 Predict the generation and transport of pollutants in the environment based on physicochemical processes and properties
- EH 7 Apply risk communication principles to inform the public about environmental issues

II. MHA Program Competencies

- MHA A. Synthesis and evaluation of the healthcare system, healthcare management, and issues related to:
 - 1. healthcare organizations,
 - 2. access to care,
 - 3. financing healthcare,
 - 4. human resources,
 - 5. financial management,
 - 6. strategic planning and thinking,
 - 7. quality improvement, and
 - 8. legal and regulatory matters.
- MHA B. Communication skills including:
 - 1. Characterizing and utilizing appropriate forms and standards of communication methods applicable in professional healthcare settings;
 - 2. Establishing best practices of communication skills; and
 - 3. Effectively identifying and responding to the audience and its wants, needs, interests, and beliefs.
- MHA C. Critical thinking, analytical skills, and problem-solving abilities including:
 - 1. Using quantitative, statistical and financial analyses to solve problems;
 - 2. Creating and using strategic planning and strategic thinking to discern among alternatives and make recommendations; and
 - 3. Applying quality improvement techniques to analyze and change organizational outcomes.
- MHA D. Leadership, Professionalism, and Ethics including:

1. Engaging people, organizations, and key stakeholders when developing goals and executing plans;
2. Mobilizing teams, using negotiating skills, and accounting for individual and organizational pressures and needs;
3. Demonstrating integrity in personal and organizational practices, respecting diverse opinions, and holding themselves and others accountable for their actions; and
4. Using a corporate ethical decision-making process in a healthcare setting and apply ethical principles and policy statements to resolve ethical issues.

III. Master of Science (MS) Program Competencies

a. Biostatistics MS

STATISTICAL THEORY

StatTheory 1: Explain the theoretical background of commonly used statistical procedures

STATISTICAL COMPUTING

Comp 1: Use computer software programs such as Excel, Access and REDCap for data entry and database management

Comp 2: Use computer programs such as SAS and JMP, computing software environments such as R, and/or computer programming languages for processing, summarizing, analyzing and displaying complex public health or biomedical data and research results

APPLIED BIOSTATISTICAL METHODS

FC 2 Select quantitative and qualitative data collection methods appropriate for a given public health context

FC 4 Interpret results of data analysis for public health research, policy or practice

Biostat 2: Determine the most appropriate method of statistical analysis reflecting a given question of interest, the implemented study design and the available data, implementing preferred methodological alternatives to commonly used statistical methods when their assumptions are not met

Biostat 3: Read the statistical methods reported in public health and medical literature and comment on their appropriateness to the study design and research questions

Biostat 4: Compare and contrast advantages and disadvantages in the use of nonparametric or parametric statistical procedures, and in the use of univariate, bivariate and multivariable procedures

EPIDEMIOLOGY

- FC 1 Apply epidemiological methods to the breadth of settings and situations in public health practice
- Epi 1 Identify, access, and integrate sources of health data such as vital statistics records, disease registries, national surveys, and medical records in order to address epidemiologic questions.
- Epi 3: Given an epidemiological investigation, compare and contrast strengths, limitations, and inference that may be drawn from data collected through the use of epidemiological research designs including cohort, case-control, ecologic, and cross-sectional studies
- Epi 4: Assess and explain strategies to summarize and report the impact of effect modification and to control for or minimize bias, including selection, information, and confounding bias when drawing inference from epidemiologic studies

DISSEMINATION OF RESEARCH RESULTS

- BComm 1: Demonstrate effective written and oral skills for communicating with different audiences in the context of professional public health or biomedical research activities
- BComm 2: Design and implement a critical review of applied public health, biomedical, and statistical research literature related to a specific topic or question of interest, critique the reported methods, and synthesize the findings

RESEARCH PROFESSIONAL PRACTICE

- Prof Biostat: Become an integral team member, as a junior analyst or research assistant, actively participating in identifying and formulating public health or biomedical questions, selecting appropriate study designs, identifying appropriate data collection and management methods, and selecting appropriate statistical analysis methods
- Prof Ethics: Demonstrate responsible conduct of research practices related to data acquisition and sharing, collaborative research, ethical research with human subjects, disclosure and management of conflicts of interest, avoidance of research misconduct, and responsible publication and authorship practices

b. BS/MS in Biostatistics

STATISTICAL THEORY

StatTheory 1: Explain the theoretical background of commonly used statistical procedures

STATISTICAL COMPUTING

Comp 1: Use computer software programs such as Excel, Access and REDCap for data entry and database management

Comp 2: Use computer programs such as SAS and JMP, computing software environments such as R, and/or computer programming languages for processing, summarizing, analyzing and displaying complex public health or biomedical data and research results

APPLIED BIOSTATISTICAL METHODS

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Biostat 2: Determine the most appropriate method of statistical analysis reflecting a given question of interest, the implemented study design and the available data, implementing preferred methodological alternatives to commonly used statistical methods when their assumptions are not met

Biostat 3: Read the statistical methods reported in public health and medical literature and comment on their appropriateness to the study design and research questions

Biostat 4: Compare and contrast advantages and disadvantages in the use of nonparametric or parametric statistical procedures, and in the use of univariate, bivariate and multivariable procedures

EPIDEMIOLOGY

FC 1 Apply epidemiological methods to the breadth of settings and situations in public health practice

Epi 1 Identify, access, and integrate sources of health data such as vital statistics records, disease registries, national surveys, and medical records in order to address epidemiologic questions.

Epi 3: Given an epidemiological investigation, compare and contrast strengths, limitations, and inference that may be drawn from data collected through the use of epidemiological research designs including cohort, case-control, ecologic, and cross-sectional studies

Epi 4: Assess and explain strategies to summarize and report the impact of effect modification and to control for or minimize bias, including selection, information, and confounding bias when drawing inference from epidemiologic studies

DISSEMINATION OF RESEARCH RESULTS

BComm 1: Demonstrate effective written and oral skills for communicating with different audiences in the context of professional public health or biomedical research activities

BComm 2: Design and implement a critical review of applied public health, biomedical, and statistical research literature related to a specific topic or question of interest, critique the reported methods, and synthesize the findings

RESEARCH PROFESSIONAL PRACTICE

Prof Biostat: Become an integral team member, as a junior analyst or research assistant, actively participating in Identifying and formulating public health or biomedical questions, selecting appropriate study designs, identifying appropriate data collection and management methods, and selecting appropriate statistical analysis methods

Prof Ethics: Demonstrate responsible conduct of research practices related to data acquisition and sharing, collaborative research, ethical research with human subjects, disclosure and management of conflicts of interest, avoidance of research misconduct, and responsible publication and authorship practices

c. Epidemiology MS

DESCRIPTIVE EPIDEMIOLOGIC METHODS

DesEpi 1: Identify, access, and integrate sources of health data such as vital statistics records, disease registries, national surveys, and medical records in order to address epidemiologic questions.

DesEpi 2: Explain the importance of epidemiology, and aspects of a public health problem in terms of magnitude, person, time and place, for informing scientific, ethical, economic and political discussion of health issues

DesEpi 3: Calculate and interpret basic descriptive epidemiology measures

ETIOLOGIC, PROGNOSTIC, AND DIAGNOSTIC RESEARCH METHODS

RschEpi 1: Communicates the pathophysiology, natural history, and relative frequencies of health conditions that are major causes of morbidity and mortality

RschEpi 2: Calculate epidemiology measures of association and accuracy in prediction or diagnosis and draw appropriate inference from epidemiologic data

- RschEpi 3: Compare and contrast strengths, limitations, and inference that may be drawn from data collected through the use of epidemiological research designs including cohort, case-control, ecologic, and cross-sectional studies
- RschEpi 4: Assess and implement strategies to summarize and report the impact of effect modification and to control for or minimize bias, including selection, information, and confounding bias when drawing inference from epidemiologic studies
- RschEpi 5: Discuss, from knowledge of the literature, the pathophysiology, natural history, and epidemiology in their chosen area of concentration (e.g., cardiovascular diseases, cancer, pediatric epidemiology, infectious diseases).

APPLIED BIOSTATISTICS

- FC 2 Select quantitative and qualitative data collection methods appropriate for a given public health context
- FC 3 Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate
- FC 4 Interpret results of data analysis for public health research, policy or practice
- Biostat 1: Use computer software for data entry and database management
- Biostat 2: Determine the most appropriate method of statistical analysis reflecting a given question of interest, the implemented study design and the available data, implementing preferred methodological alternatives to commonly used statistical methods when their assumptions are not met
- Biostat 3: Read the statistical methods reported in public health and medical literature and comment on their appropriateness to the study design and research questions

DISSEMINATION OF RESEARCH RESULTS

- EComm 1: Demonstrate effective written and oral skills for communicating with different audiences in the context of professional public health or biomedical research activities
- EComm 2: Design and implement a critical review of applied public health, biomedical, and epidemiological research literature related to a specific topic or question, critique the reported methods, and synthesize the findings

RESEARCH PROFESSIONAL PRACTICE

- Prof Epi: Become an integral team member, as a junior epidemiologist or research assistant, actively participating in identifying public health or biomedical questions, selecting appropriate study designs, identifying appropriate data collection and management methods, and selecting appropriate statistical analysis methods to address the questions of interest

Prof Ethics: Demonstrate responsible conduct of research practices related to data acquisition and sharing, collaborative research, ethical research with human subjects, disclosure and management of conflicts of interest, avoidance of research misconduct, and responsible publication and authorship practices

d. Health Promotion Sciences MS

- HPS 1 Apply theories, concepts, and models from a range of social and behavioral disciplines that are used in public health research and practice
- HPS 2 Analyze individual, organizational, and community concerns, assets, resources and deficits for social and behavioral science interventions
- HPS 3 Apply ethical principles to public health program planning, implementation and evaluation
- HPS 4 Evaluate multiple targets and develop multiple levels of intervention for social and behavioral science programs and/or policies
- HPS 5 Apply basic concepts and skills involved in culturally appropriate community engagement and empowerment with diverse communities
- HPS 6 Demonstrate principles of community-based participatory research to improve health in diverse populations
- HPS 7 Differentiate among goals, measureable objectives, related activities, and expected outcomes for a public health program
- HPS 8 Differentiate the purposes of formative, process, and outcome evaluation
- HPS MS 1 Understand and implement qualitative or quantitative research techniques including methodological conceptualization, technique selection, analysis types, limits of techniques, computer assisted coding, and selected techniques such as focus group research, social marketing, complex participant-observation, rapid appraisal methods, use of computer assisted statistical packages, and selected statistical methods such as, regression analysis, non-parametric methods, linear models, and analysis of multivariate data.
- HPS MS 2 Apply knowledge of a significant public health problem in a substantive content area germane to research related to areas such as, minority, adolescent, aging, maternal and child, international, and gender health.

e. Industrial Hygiene/Environmental Health Sciences MS

- IH 1: Describe patterns and mechanisms of occupational/environmental diseases based upon interpretation of epidemiologic evidence and knowledge of toxicological/physiological interaction of hazardous agents with the human body.

- IH 2: Recognize and identify sources of chemical, physical, biological, and ergonomic stressors, and predict qualitative and quantitative aspects of the generation of these stressors
- IH 3: Design programs or procedures to reduce or eliminate occupational and environmental hazards, including the recommendation and evaluation of controls in accordance with the hierarchy of controls.
- IH 4: Select and use appropriate strategies and methods for quantitative and qualitative exposure assessment, and apply statistical principles to the collection and interpretation of industrial hygiene, safety, and environmental data.
- IH 5: Communicate effectively with all levels of an organization, with the public, and with professional peers concerning health and safety.
- IH 6: Interpret and apply relevant occupational and environmental regulations and standards.
- IH 7: Understand ethical responsibilities and the impacts of professional practice in the organizational, societal, and global contexts of public health.
- IH 8r: Make a business case for occupational/environmental health and safety programs, and promote teamwork, management systems, and workplace culture to develop and sustain such programs.
- IH 9: Demonstrate research and critical thinking skills necessary to maintain and enhance one's professional competence throughout one's career.
- IH 10: Identify vulnerable populations at disparate risk of adverse occupational and/or environmental health outcomes based upon societal inequalities.

IV. Doctor of Philosophy (PhD) Program Competencies

a. Biostatistics PhD

STATISTICAL METHODS DEVELOPMENT

- StatDev 1: Independently develop statistical research questions of interest concerning the properties of tests or estimators and the application of existing statistical methods in novel ways
- StatDev 2: Develop new statistical methods
- StatDev 3: Explain and derive the theoretical background of a broad class of statistical procedures including theoretical knowledge of the student's doctoral research area of interest in biostatistical methods

STATISTICAL COMPUTING AND SIMULATION STUDY PROGRAMMING

- Prog 1: Use computer software and/or programming languages for data simulation to evaluate the properties of statistical methods
- Prog 2: Develop computer programs to process, summarize, analyze and display data from complex public health or biomedical data and research results in a wide range of software applications and computing environments including SAS, R, JMP, GIS tools, and/or WinBugs

TEACHING

- Teach Biostat 1: Assist a faculty member in teaching graduate level courses in biostatistics by developing course material, delivering lectures, leading review and discussion sections, or writing and grading homework assignments and exams
- Teach Biostat 2: Train others in the design of research studies and analysis of data, including students in the fields of biostatistics, epidemiology, public health, and biomedical sciences

RESEARCH PROGRAM DEVELOPMENT

- RschPgm 1: Collaborate on interdisciplinary research teams by providing research design and data analysis support for research and evaluation projects
- RschPgm 2: Identify and formulate public health or biomedical research questions, selecting appropriate study designs, identifying appropriate data collection and management methods, and selecting appropriate statistical analysis methods
- RschPgm 3: Direct staff and student research team members who serve as research coordinators or data analysts
- Prof Ethics: Demonstrate responsible conduct of research practices related to data acquisition and sharing, collaborative research, ethical research with human subjects, disclosure and management of conflicts of interest, avoidance of research misconduct, and responsible publication and authorship practices

APPLIED BIOSTATISTICAL METHODS

- BMethod 1: Apply and interpret results from descriptive analyses according to the type of study design, measurement scale, and available data for answering a particular research question
- BMethod 2: Utilize unbiased and efficient inferential methodologies, appropriate for the study design, measurement scale and available data, for estimation of parameters of interest
- BMethod 3: For a broad range of complex studies, determine the most appropriate method of statistical analysis, reflecting a given question of interest, the implemented study design and the available data, implementing preferred methodological

alternatives to commonly used statistical methods when their assumptions are not met

BMethod 4: Implement and interpret results from univariate, bivariate and multivariable procedures, acknowledging issues related to statistical power and overfitting available data, relative to the research study design and available data

BMethod 5: Critically evaluate the statistical methods reported in public health and medical literature, commenting on their appropriateness relative to the study design and research questions

EPIDEMIOLOGIC METHODS

EMethod1: Identify aspects of a public health problem in terms of magnitude, person, time and place, for informing scientific, ethical, economic and political discussion of health issues

EMethod2: Accounting for complex sampling strategies, data measurement methods, and data completeness, analyze health data such as vital statistics records, disease registries, national surveys, and medical records in order to address epidemiologic questions

EMethod3: Calculate and interpret epidemiologic measures of disease burden, distribution, and association

EMethod4: Given an epidemiological investigation, compare and contrast strengths, limitations, and inference that may be drawn from data collected through the use of epidemiological research designs including cohort, case-control, ecologic, and cross-sectional studies

EMethod5: Assess and implement strategies to summarize and report the impact of effect modification and to control for or minimize bias, including selection, information, and confounding bias when drawing inference from epidemiologic studies

DISSEMINATION OF RESEARCH RESULTS

Com BP1: Design and implement a critical review of applied public health, biomedical, and statistical research literature in a specialty area, critique the reported methods, and synthesize the findings

Com BP2: Demonstrate effective written and oral skills for communicating with different audiences in the context of statistical methodology development, professional public health practice, or biomedical research activities

b. Epidemiology PhD

EPIDEMIOLOGIC RESEARCH PROGRAM DEVELOPMENT

- EpiPgm1: Discuss, from knowledge of the literature, the pathophysiology, natural history, and epidemiology in their chosen area of concentration (e.g., cardiovascular diseases, cancer, pediatric epidemiology, infectious diseases).
- EpiPgm2: Generate relevant epidemiological research questions that contribute new knowledge to the field
- EpiPgm3: Independently design and implement epidemiologic studies to answer specific research questions using a variety of designs, interpret study results and relate findings to the relevant scientific literature
- EpiPgm4: Direct and manage research staff and student assistants who are conducting project management, data collection and processing, and data analysis tasks
- Prof Ethics: Demonstrate responsible conduct of research practices related to data acquisition and sharing, collaborative research, ethical research with human subjects, disclosure and management of conflicts of interest, avoidance of research misconduct, and responsible publication and authorship practices

COLLABORATIVE RESEARCH PROGRAM DEVELOPMENT

- EpiCol1: Collaborate on interdisciplinary research teams and advocate for the importance of epidemiologic approaches to defining aspects of a public health problem in terms of magnitude, person, time and place, for informing scientific, ethical, economic and political discussion of health issues
- EpiCol2: Become an integral team member actively participating in identifying public health or biomedical questions, selecting appropriate study designs, identifying appropriate data collection and measurement methods, and selecting appropriate statistical analysis methods to address the questions of interest while minimizing bias and measurement error or misclassification

ADVANCED EPIDEMIOLOGIC METHODS

- Epi Meth1: Critically appraise and synthesize information related to the pathophysiology, natural history, and relative frequencies of health conditions that are major causes of morbidity and mortality
- Epi Meth2: Calculate epidemiology measures and draw appropriate inference from epidemiologic data, utilizing advanced statistical methods that are appropriate for the given research design, measurement scale, population dynamics, and degree of measurement error or misclassification
- Epi Meth3: Assess and implement strategies to summarize and report the impact of effect modification and to control for or minimize bias, including selection, information, and confounding bias when drawing inference from epidemiologic studies

Epi Meth4: Given an epidemiological investigation, compare and contrast strengths, limitations, and inference that may be drawn from data collected through the use of epidemiological research designs including cohort, case-control, ecologic, and cross-sectional studies

Epi Meth5: Accounting for complex sampling strategies, data measurement methods, and data completeness, analyze health data such as vital statistics records, disease registries, national surveys, and medical records in order to address epidemiologic questions

TEACHING EPIDEMIOLOGY

Teach Epi 1: Assist a faculty member in teaching graduate level courses in epidemiology by developing course material, delivering lectures, leading review and discussion sections, or writing and grading homework assignments and exams

Teach Epi 2: Train others in the design of research studies and analysis of data, including students in the fields of biostatistics, epidemiology, public health, and biomedical sciences

APPLIED BIostatISTICS METHODS

BMethod 1: Apply and interpret results from descriptive analyses according to the type of study design, measurement scale, and available data for answering a particular research question

BMethod 2: Utilize unbiased and efficient inferential methodologies, appropriate for the study design, measurement scale and available data, for estimation of parameters of interest

BMethod 4: Implement and interpret results from univariate, bivariate and multivariable procedures, acknowledging issues related to statistical power and overfitting available data, relative to the research study design and available data

DISSEMINATION OF RESEARCH RESULTS

Comm Epi P1: Design and implement a critical review of applied public health, biomedical, and epidemiological research literature in a specialty area, critique the reported methods, and synthesize the findings

Comm Epi P2: Demonstrate effective written and oral skills for communicating the objectives, design, implementation and results of epidemiologic investigations with different audiences in the context of professional public health practice or biomedical research activities

c. Health Promotion Sciences PhD

HPSDoc 1 Critique, apply, and advise upon the theoretical foundations of health promotion sciences from the perspective of all levels of the ecological model including

individuals, small groups, communities, organizations, government, and social policy.

- HPSDoc 2 Apply the array of health promotion intervention strategies from the most current research, theoretical, methodological, and practice models, and contribute new strategies to the field.
- HPSDoc 3 Understand, implement, and advise upon qualitative research techniques including methodological conceptualization, technique selection, analysis types, limits of techniques, computer assisted coding, and selected techniques such as focus group research, social marketing, complex participant-observation, and rapid appraisal methods.
- HPSDoc 4 Understand, implement, and advise upon quantitative research techniques including methodological conceptualization, technique selection, analysis types, limits of techniques, use of computer assisted statistical packages, and selected statistical methods such as, regression analysis, non-parametric methods, linear models, and analysis of multivariate data.
- HPSDoc 5 Understand, implement, and advise upon program evaluation types and strategies, selection criteria for use of specific evaluation types, advanced principles of program evaluation implementation, and methods associated with each program evaluation type.
- HPSDoc 6 Apply and advise upon implementation of the principles of social and behavioral science disciplines relevant to public health, such as anthropology, communication, political science, psychology, sociology, and social work.
- HPSDoc 7 Contribute original research to the field that addresses significant public health problems.

d. Occupational and Environmental Health PhD

- OEH D1 Exhaustively search and critically review the scientific literature in a chosen area of occupational and environmental health
- OEH D2 Formulate testable scientific hypotheses
- OEH D3 Design studies to test scientific hypotheses or otherwise produce meaningful findings
- OEH D4 Use, and if appropriate, develop valid tools to collect and interpret data
- OEH D5 Demonstrate understanding of the chosen area of specialization within occupational and environmental health
- OEH D6 Recognize the limits of one's own knowledge, and demonstrate the ability to seek and implement advice or collaboration as necessary

- OEH D7 Understand the responsible conduct of research, including data acquisition, management, sharing and ownership; mentor/student responsibilities; publication practices and responsible authorship; peer review; collaborative science; research misconduct; conflict of interest, and protection of human subjects and of animals in research
- OEH D8 Communicate research to scientific peers accurately and in a professional manner
- OEH D9 Convey broad knowledge of occupational and environmental health in an educational setting