**Epidemiology Department MPH Core Competencies**

1. Identify and describe population patterns of health-related risk factors and health-related outcomes in terms of person, place and time.

2. Be familiar with the current major public health issues and be able to identify and evaluate the determinants of these public health issues (e.g. demographic, pathophysiological, genetic, environmental, infectious, behavioral, and social).

3. Calculate and interpret measures of event frequency (e.g. prevalence, incidence) and measures of association (e.g. odds ratio, relative risk, attributable risk) and be able to articulate the uses and limitations of these measures.

4. Know the different epidemiologic study designs including the relative strengths and weaknesses of each, and be able to propose an appropriate design strategy when presented with a research question.

5. Understand and be able to apply analytical approaches to data from different epidemiologic study designs (e.g. cross-sectional, cohort, randomized studies).

6. Be familiar with the basic tools of causal inference in epidemiology (e.g. counterfactuals, directed acyclic graphs, fundamental of systems approaches).

7. Understand epidemiologic concepts of causal inference including bias, confounding and effect modification, and be able to apply study design and analytical approaches to minimize, assess or account for them in epidemiologic studies.

8. Be familiar with basic aspects of field methods in epidemiology (e.g. human subject protection, data collection and management, survey design, sampling strategies, calculating power, and public health surveillance).

9. Demonstrate effective communication of epidemiologic findings in written and oral formats.

10. Be exposed to published epidemiologic studies and be able to critically appraise epidemiological findings.

**Track Specific Competencies**

**GHE Competencies**

1. Be able to explain the history of Global Health, key initiatives in the field and the intersection of health and development strategies over time, including the role of international agencies, local and national governments, and non-governmental organizations in global health governance and practice.

   *Course(s):* EPID 506 (3) Health of Nations: Introduction to Global Health

2. Identify and access sources of health data in low and middle income countries, describe the global burden of disease, risk factors and health trends in low and middle income countries and understand the scope and limitations of available data.
Course(s): EPID 506 (3) Health of Nations: Introduction to Global Health; EPID 665 (2) Research Seminar in Global Health

3. Understand the steps involved in developing infrastructure for essential health research in low and middle income countries and develop awareness of the ethical issues of conducting research in low and middle income countries including ability to articulate the roles of the local review.

Course(s): EPID 506 (3) Health of Nations: Introduction to Global Health; EPID 664 (2) Field Methods in Epidemiology for Developing Countries

4. Gain practical experience in field research in a low or middle income country, develop strategies for resolving problems that arise when conducting epidemiology studies in these countries, and demonstrate contextual expertise in at least one country/region including knowledge of the structure of health systems and the public health infrastructure as well as major public health programs (i.e. immunization programs, reproductive health programs, etc.) of that country.

Course(s): EPID 664 (2) Field Methods in Epidemiology for Developing Countries; Summer Internship; EPID 657/658 (1) Field Internship in Epidemiology I and II; EPID 665 (2) Research Seminar in Global Health

5. Appreciate the importance of cultural context in conducting research and implementing interventions in low and middle income countries and demonstrate the ability to communicate and work effectively with stakeholders from other cultural contexts including scientists, local and national government, and members of the public, industry.

Course(s): EPID 664 (2) Field Methods in Epidemiology for Developing Countries; EPID 657 (1) Field Internship in Epidemiology I; Summer Internship

OEE Competencies

1. Demonstrate mastery of the relevant biological and behavioral mechanisms that influence human exposures to and health effects of environmental and occupational stressors.

   Course(s): EHS 601 (3) Foundations in Environmental Health Sciences; EHS/EPID 608 (3) Environmental Epidemiology

2. Identify effective and efficient data collection techniques to characterize environmental and occupational exposures.

   Course(s): EHS 601 (3) Foundations in Environmental Health Sciences

3. Comprehend advanced study designs and biostatistical approaches common in environmental and occupational epidemiology.

   Course(s): EHS/EPID 675 (3) Data Analysis for Environmental Epidemiology

4. Understand the regulatory context of environmental and occupational exposures, including a knowledge of key policies and relevant authorities.

   Course(s): EHS 602 (2) Environmental Health Science Policy
**Hospital and Molecular Epidemiology Program Competencies**

1. Familiarity with the basic principles of molecular epidemiology (e.g., selecting, validating and applying molecular markers, and molecular typing in epidemiologic studies).

   *Course(s): EPID 582 (3) Molecular Epidemiology; EPID 525 (3) Clinical and Diagnostic Microbiology*

2. Ability to apply basic molecular epidemiologic principles to public health practice, and epidemiologic research in hospital and community settings.

   *Course(s): EPID 680 (3) Hospital Epidemiology I; EPID 582 (3) Molecular Epidemiology*

3. General understanding of the principles of infectious diseases, infection prevention, microbiology, molecular biology and genetics.

   *Course(s): EPID 605 (3) Infectious Disease Epidemiology; EPID 602 (3) Foundations in Infectious Disease Transmission modeling; EPID 545 (3) Polymicrobial Communities Laboratory; EPID 560 (3) Mechanisms of Bacterial Pathogenesis; EPID 576; EPID 505 (3) Polymicrobial Communities in Human Health and Disease; EPID 525 (3) Clinical and Diagnostic Microbiology; Micro 405; Micro 515; Micro 460; CEE 582; CEE 693*

4. In depth knowledge in at least one of the following: microbiology, molecular biology, genetics or infection control.

   *Course(s): EPID 560; Micro 607; Micro 615; MCDB 589; EEB 512; EPID 681*

5. Demonstrate mastery in one or more cutting edge laboratory techniques.

   *Course(s): EPID 565*

6. Gain practical experience in the design, conduct and analysis of molecular epidemiologic studies.

   *Course(s): EPID 565; EPID 582*