**Core (C) and Specialization (S) Competencies vs. Program Competencies - Master of Science and Master of Public Health Programs with Specialization in Biomedical Informatics**

| Required(R) / Elective(E) For: | | | MPH Core Competencies | | | | | | | | | | MPH Specialization Competencies | | | | | | | | MS Competencies | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MS | MPH | Course | C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| N/A | R | PUBHLTH 7189 - Practicum in Public Health | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | | | | | |
| N/A | R | PUBHLTH 7998 - Culminating Project in Public Health | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | | | | | | | | | | | |
| R | R | BMI 5710 - Introduction to Biomedical Informatics | X | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| R | R | BMI 5740 - Introduction to Research Informatics | X | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | | X | X | X | X | | X | X | X | X | X | X |
| E | R | BMI 5760 - Public Health Informatics | X | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| R | R | BMI 7840 - Advanced Topics in Biomedical Data Management | X | X | X | | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | X | X | X | X | X | X | | X | X | X | X | X | X |
| R | R | BMI 7891 - Seminars in Biomedical Informatics | X | X | X | X | X | X | | X | X | X | | | | | | | | | X | X | X | X | X | X | X | X | | X | | | | X | X |
| E | E | BMI 5730 - Introduction to Bioinformatics | X | X | X | | | X | | X | X | X | X | X | X | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| E | E | BMI 5750 - Methods in Biomedical Informatics and Data Analytics | X | | X | | | | | | X | X | | | | X | X | X | X | X | | | | | | | | | | | | | | | |
| E | E | 5770 - Health Analytics | X | X | X | | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | X | X | |
| E | E | BMI 7810 - Design & Methodological Studies in Biomedical Informatics | X | | | X | X | | | X | X | X | X | X | X | X | X | X | X | X | X | | | X | X | X | X | X | X | X | | X | | | X |
| E | E | BMI 7830 - Advanced Bioinformatics Approaches to Human Diseases | X | X | X | | | X | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| R | E | BMI 7999 - Thesis Research in Biomedical Informatics | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |

**MASTER OF PUBLIC HEALTH WITH SPECIALIZATION IN BIOMEDICAL INFORMATICS CORE COMPETENCIES**

1. Apply appropriate descriptive and inferential **statistical** techniques to public health data and interpret results of statistical analyses in the context of public health research and evaluation
2. Apply foundational principles of **environmental health science** to categorize sources and types of contaminants, matrices involved, pathways for and modes of exposure, associated health effects and societal issues, approaches to control, and major regulations
3. Apply **epidemiologic** principles to investigate the distribution of risk factors and disease in the population to improve public health
4. Apply evidence-based concepts of **health behavior and health promotion** to the design of public health messages and strategies
5. Discuss the major components of the U.S. health care system and be able to apply their understanding to examine **health policy and health program** issues
6. Demonstrate effective written and oral skills for communicating with different audiences in the context of professional public health activities
7. Develop public health programs and strategies responsive to the diverse cultural values and traditions of the communities being served
8. Apply the core functions of assessment, policy development, and assurance in the analysis of global public health problems and their solutions
9. Apply basic principles of ethical analysis to issues of public health practice and policy
10. Collaborate with multidisciplinary groups to recognize and evaluate public health issues and develop strategies for intervention

**BIOMEDICAL INFORMATICS SPECIALIZATION COMPETENCIES**

1. Compare and contrast types of major domestic and international public health issues, including sources/causes of infectious/chronic diseases, transmission, risk factors, morbidity and mortality.
2. Discuss various approaches/strategies for identification, response and intervention to address and attempt to resolve common public health issues.
3. Identify genetic, social, political, cultural, behavioral, socioeconomic, demographic and ethical factors and relationships to domestic and international public health issues and determinants of health.
4. Use basic tools and apply the fundamental principles of the five core disciplines of public health (biostatistics; environmental health; epidemiology; health administration/policy; health behavior/promotion) for domestic and international population health issues.
5. Utilize existing knowledge sources (e.g. databases) commonly used for biomedical informatics.
6. Discuss core biomedical informatics theories, methods, and practice areas from individual and population-based perspectives.
7. Interpret applicable research articles.
8. Apply principles of ethics for professional practice and responsible conduct of research.

**MASTER OF SCIENCE WITH SPECIALIZATION IN BIOMEDICAL INFORMATICS COMPETENCIES**

1. Compare and contrast types of major domestic and international public health issues, including sources/causes of infectious/chronic diseases, transmission, risk factors, morbidity and mortality.
2. Discuss various approaches/strategies for identification, response and intervention to address and attempt to resolve common public health issues.
3. Identify genetic, social, political, cultural, behavioral, socioeconomic, demographic and ethical factors and relationships to domestic and international public health issues and determinants of health.
4. Use basic tools and apply the fundamental principles of the five core disciplines of public health (biostatistics; environmental health; epidemiology; health administration/policy; health behavior/promotion) for domestic and international population health issues.
5. Utilize existing knowledge sources (e.g. databases) commonly used for biomedical informatics.
6. Discuss core biomedical informatics theories, methods, and practice areas from individual and population-based perspectives.
7. Interpret applicable research articles.
8. Apply principles of ethics for professional practice and responsible conduct of research.
9. Read the scientific literature in the student s field and critique the methods and results.
10. Conduct literature reviews to evaluate the state of the science regarding specific topics.
11. With input from the student s advisor, identify an unanswered research question, formulate a hypothesis, and design a research study.
12. Write a research proposal.
13. Conduct a research study.
14. Evaluate research data and prepare a report summarizing the data, interpreting the statistical results, and presenting the findings, limitations and conclusions.
15. Present and explain the study s purpose, methods, results and conclusions to an informed audience.