

DOCTOR OF PHILOSOPHY IN NATURAL SCIENCES: BIOMEDICAL AND HEALTH INFORMATICS

As part of the Natural Sciences Ph.D. program, students in a primary discipline of Biomedical and Health Informatics must meet the minimum Ph.D. program requirements. These can be found within the main program page (<https://catalog.umkc.edu/colleges-schools/graduate-studies/phd-programs/>) and subsequent requirement pages.

Biomedical and Health Informatics

Please see the School of Graduate Studies web page (<https://sgs.umkc.edu/academics/nat-sci-coordinators.html>) for the contact information for the discipline Coordinator. To view all doctoral and graduate faculty in Biomedical and Health Informatics, see this web page (<https://sgs.umkc.edu/faculty-and-staff/doctoral-graduate-faculty-lists.html>).

Admission Requirements

The GRE test is required in most cases for primary discipline applicants. Applicants to the secondary discipline in Biomedical and Health Informatics must meet the requirements of their intended primary discipline.

Applicants must meet both the general and the discipline-specific criteria for admission and be recommended for admission by the faculty review group. Upon approval by the graduate dean, students are admitted to the School of Graduate Studies.

Please see the website (<https://sgs.umkc.edu/admissions/natural-sciences-apply.html>) for updated application deadlines.

Discipline Overview

Biomedical and Health Informatics is the "scientific field that deals with biomedical information, data, and knowledge - their storage, retrieval, and optimal use for problem solving and decision making. It accordingly touches on all basic and applies fields in biomedical science and is closely tied to modern information technologies, notably in the areas of computing and communication, i.e. medical computer science." (Definition from Stanford University, Medical Informatics.) The National Center for Biotechnology Information defines Bioinformatics as the "Field of science in which medicine, biology, computer science, and information technology merge to form a single discipline. The ultimate goal of the field is to enable the discovery of new biological insights as well as to create a global perspective from which unifying principles in biology and health can be discerned."

Curriculum Overview

The goal of the Biomedical and Health Informatics Ph.D. discipline is to train researchers to contribute to the translation of basic science findings into patient care and ultimately into community standards and policy. Given the diversity of specialties that are included in the field of biomedical and health informatics, individual training will vary depending on the student's career goals. Graduates of this discipline will be able to apply knowledge and skills in the area of biomedical and health informatics by: generating a research hypothesis; proposing, conducting, and reporting research; performing appropriate statistical analysis; and, communicating scientific information.

Core Coursework Requirements

Students with a Biomedical and Health Informatics primary discipline will complete a minimum of 48 credit hours for the degree. This includes at least 21 credit hours in the primary discipline, 9-12 hours outside the primary discipline (decided in consultation between the student and primary advisor), 6 credit hours of electives, and at least 12 hours of dissertation credit in the primary discipline.

The core 21 hours of primary discipline coursework must include the 18 hours listed below: 6 credit hours should be taken from Biostatistics; 6 credit hours should be taken from the Research Methodology area, and 6 credit hours should be taken from the Informatics area. Courses taken to meet this requirement may be adjusted to reflect the courses taken in the chosen secondary discipline.

Primary Discipline Program Requirements

Code	Title	Credits
Biostatistics options below:		6
MEDB 5501	Applied Biostatistics I ¹	
MEDB 5502	Applied Biostatistics II ¹	
MEDB 5503	Biostatistics III-Mixed-Effects Models	
MEDB 5535	Quantitative Aspects of Epidemiologic Research	
Research Methodology options below:		6
MEDB 5510	Clinical Research Methodology	
MEDB 5561	Responsible Conduct of Research	
Informatics options below:		6
MEDB 5520	Introduction to Medical Informatics	
MEDB 5521	Clinical Bioinformatics	

MEDB 5525	Social Determinants of Health	
COMP-SCI 5565	Introduction to Machine Learning	
COMP-SCI 5590	Special Topics (Machine Learning)	
Electives (coursework should be in Biomed)		3
Coursework Outside of Primary Discipline (either in designated secondary discipline or multiple other disciplines) ²		9
Electives (coursework can be from any discipline)		6
Dissertation		12
Total Credits		48

¹ Required Course

² Minimum of 9 hours with possibility of more required. Decided in consultation with primary advisor.

Total Credit Hours: 48

Secondary Discipline Program Requirements

Students with a Biomedical and Health Informatics secondary discipline will complete a minimum of 9 credit hours in the discipline.

Code	Title	Credits
A minimum of 9 credit hours, as listed below:		
MEDB 5501	Applied Biostatistics I	3
MEDB 5502	Applied Biostatistics II	3
MEDB 5510	Clinical Research Methodology	3
Depending on prior coursework, the below may be substituted:		
MEDB 5511	Principles and Applications of Epidemiology	
MEDB 5514	Human Genome Epidemiology	
MEDB 5520	Introduction to Medical Informatics	
MEDB 5535	Quantitative Aspects of Epidemiologic Research	
Total Credits		9