BIOMEDICAL AND HEALTH INFORMATICS, MS

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Degree: Master of Science (MS)
Field of Study: Biomedical and Health Informatics

Program Overview

The Master of Science in Biomedical and Health Informatics (BHI) program offers non-thesis and thesis-based options. While the usual time to completion with a full-time schedule is 16 months, students have the option of doing the non-thesis program intensively in 11 months. Part-time students are welcome to do the program at their preferred pace!

The BHI program offers pragmatic, interdisciplinary areas of study immediately relevant in contemporary health systems or research enterprises. Our Master's degree program is unique in that it encompasses both biomedical research and clinical care informatics with applications to precision medicine, accountable care organizations, and reproducible science. Our program provides grounding across multiple disciplines and will be of interest if you seek a career in which you:

- Analyze patient diagnoses, treatments and outcomes, based on electronic health records, to inform best practices in clinical care
- Design or manage studies in the clinical setting to inform quality and safety process improvements
- Collaborate in biomedical research, including the analysis of large genetic and various "omics" studies, integrated with clinical or population data, to advance the understanding of diseases
- Design and manage studies that draw from clinical, cohort or population data to inform the assessment and development of devices, therapeutics or other interventions

We bring together a diverse group of faculty from across Case Western Reserve University – the School of Medicine, clinical faculty from our affiliated hospitals, the Weatherhead School of Management, and the Case School of Engineering – for a cross-disciplinary approach that offers the opportunity to craft tailored areas of study grounded in core competencies:

- Data analytics
- Biomedical, clinical and/or population health research
- Computational and systems research design

Important Note: The program information contained on this page is current as of May 1st, 2023. For the most current information, we advise you to review the MS in Biomedical and Health Informatics program handbook.

Graduate Policies

For graduate policies and procedures, please review the School of Graduate Studies section of the General Bulletin.

Program Requirements

Non-Thesis Program

This program requires 27 credit hours of coursework and a 3 credit hour project or internship/practicum, with a report that is evaluated by the student's mentorship/advisory committee.

Thesis Program

This is for students who may want to continue into a PhD program. It requires 24 credit hours of course work and 6 credit hours developing and presenting a thesis, evaluated by the mentoring/advisory committee.

Course List

The required curriculum contains courses that expose students to both the Biomedical and Health Domain and the Computation and System Design Domain. However, students will need to select a class from the Data Analytics Domain to meet their requirements.

Code	Title	Hours
Required Courses:		**12**
PQHS 413	Introduction to Data Structures and Algorithms in Python	
PQHS 416	Computing in Biomedical Health Informatics	
PQHS 431	Statistical Methods I	
PQHS 490	Epidemiology: Introduction to Theory and Methods	
Biomedical and Health Domain Courses:		
EBME 410	Medical Imaging Fundamentals	
MPHP 406	History and Philosophy of Public Health	
PQHS 440	Introduction to Population Health	
PQHS 451	A Data-Driven Introduction to Genomics and Human Health	
PQHS 465	Design and Measurement in Population Health Sciences	
PQHS 490	Epidemiology: Introduction to Theory and Methods	
Computation and System Design Domain Courses:		
CSDS 410	Analysis of Algorithms	
CSDS 433	Database Systems	
CSDS 458	Introduction to Bioinformatics	
CSDS 477	Advanced Algorithms	
CSDS 493	Software Engineering	
PQHS 471	Machine Learning & Data Mining	
PQHS 427	Geospatial Analytics for Biomedical Health Applications	
Data Analytics Domain Courses:		**3**
Choose one of the following:		
EBME 419	Applied Probability and Stochastic Processes for Biology	
PQHS 432	Statistical Methods II	
PQHS 453	Categorical Data Analysis	
PQHS 459	Longitudinal Data Analysis	
PQHS 467	Comparative and Cost Effectiveness Research	
PQHS 515	Secondary Analysis of Large Health Care Databases	
PQHS 426	An Introduction to GIS for Health and Social Sciences	
Elective Courses [a]		6-9

Thesis or Practicum/Internship: [b]		**3-6**
PQHS 651 or PQHS 602	Thesis M.S. Practicum	
Total Hours		**27**

a Non-thesis Program requires 9 credit hours of electives. Thesis Program requires 6 credit hours of electives.

b Non-thesis Program requires PQHS 602 for 3 credit hours. Thesis Program requires PQHS 651 for 6 credit hours.

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Sample Plan of Study

First Year		
Fall		**Hours**
PQHS 413	Introduction to Data Structures and Algorithms in Python	3
PQHS 431	Statistical Methods I	3
PQHS 490	Epidemiology: Introduction to Theory and Methods	3
	Hours	**9**
Spring		
PQHS 416	Computing in Biomedical Health Informatics	3
Domain Area Course or Elective		3
Domain Area Course or Elective		3
	Hours	**9**
Second Year		
Fall		
Elective		3
PQHS 651 or PQHS 602 or ELECTIVE	Thesis M.S. or Practicum or	3
	Hours	**6**
Spring		
PQHS 602 or PQHS 651	Practicum or Thesis M.S.	3
ELECTIVE		3
	Hours	**6**
	Total Hours	**30**