

# HEALTH AND BIOMEDICAL INFORMATICS

Degree Types: MS

Informatics methods are becoming standard in many areas of biological and medical research. However, much of this research and training centers around using HBMI tools to answer research questions. In contrast, HBMI training focuses on building new tools.

HBMI is frequently compared to computer science and information technology. While Informatics uses computers, it is not fundamentally *about* computers or technology. Rather, it is about the *information*. In addition, computer science focuses on generalized solutions to generalized problems. Informatics tends to focus of the specifics of target domains that make them resistant to generalized solutions. While most informatics students learn some computer programming, the computer courses are a small fraction of the total curriculum.

Students in this program are required to complete and defend a master's thesis to satisfy the requirement for graduation. An examination committee for an MS thesis consists of at least three faculty members.

This program is geared primarily toward doctorally-prepared researchers who wish to gain additional experience in HBMI. Students in this program take courses with those in our doctoral programs. Individuals interested in Health IT and Operational Informatics are encouraged to look into the MS in Health Informatics (MHI) program (<https://sps.northwestern.edu/masters/health-informatics/>). Individuals interested in a PhD should look into the Informatics track of the HSIP or DGP program.

## Additional resources:

- Department website (<https://www.preventivemedicine.northwestern.edu/divisions/health-and-biomedical-informatics/>)
- Program handbook(s)

## Degree Offered

- Health and Biomedical Informatics MS (<https://catalogs.northwestern.edu/tgs/health-biomedical-informatics/health-biomedical-informatics-ms/>)

## Health and Biomedical Informatics Courses

### HBMI 421-0 American Healthcare System (1 Unit)

The course provides knowledge of the key components of health care in the United States—the policy, economic, and societal forces that shape health care delivery. The course serves as an introduction to elements of the American health care system, including the provider components, the financing of health care, the basic structure of public policy making and public health systems, a comparative analysis of the American system to health care systems of other countries, and the legal and regulatory framework within the American health care system functions. In addition to the structural components of the system, the course reviews current issues within the American health care system, including public health, preparedness, quality of health care, health reform, payment mechanisms, and consumerism.

### HBMI 422-0 Introduction to Clinical Thinking (1 Unit)

This course provides an introduction to the clinical environment throughout the health center. It is designed for students not previously involved in clinical medicine and those trained in medicine outside the United States. The course features problem-based learning and traditional medical informatics task domains and covers medical terminology and basic pathophysiology. Topics include the clinical setting, eliciting information from patients, synthesizing the history and physical examination, establishing diagnosis, treatment planning, integrating evidence-based medicine, and using an intelligent medical record in a complex environment. This is a technologist-track course for students with little clinical experience.

### HBMI 423-0 Decision Support Systems and Health Care (1 Unit)

This course provides an introduction to clinical decision support systems in health information technology. Instruction is given in formal decision analysis techniques as they apply to decisions in the medical domain. Clinical decision support systems are introduced and issues relating to their design and implementation discussed. The mathematical foundations upon which they are based will be examined. Evidence-based guidelines and performance measurement techniques will be presented. A framework for designing and implementing clinical decision support systems will be introduced. Principles learned from this framework will be applied in writing a final paper that describes a prototype decision support system, including justification for its use and a description of steps followed in its design, implementation and performance measurement.

### HBMI 499-0 Health and Biomedical Informatics (HBMI) Independent Study (1 Unit)

Independent Study and Research.