

# HEALTH INFORMATICS

The Master of Science in Health Informatics program requires the successful completion of 12 courses. Students must complete five core courses and seven additional courses corresponding to a chosen area of specialization. Specializations allow students to tailor their studies to specific career goals. There are three specializations: Clinical Informatics (<https://catalogs.northwestern.edu/sps/graduate/health-informatics/health-informatics-ms-clinical-informatics-specialization/>), Health Administration Informatics (<https://catalogs.northwestern.edu/sps/graduate/health-informatics/health-informatics-ms-administration-specialization/>), and Health Technology Informatics (<https://catalogs.northwestern.edu/sps/graduate/health-informatics/health-informatics-ms-technology-specialization/>).

The dynamic field of health informatics operates at the convergence of healthcare and information technology. The online Master of Science in Health Informatics (MHI) program is offered in partnership with Northwestern University's Feinberg School of Medicine, a leader in the medical community. MHI students prepare for emerging opportunities and roles across the healthcare enterprise in classes taught by thought leaders (<https://sps.northwestern.edu/masters/health-informatics/faculty.php>) in the informatics field. Graduates leave the program ready to leverage technology tools and data for more efficient, patient-centered healthcare delivery and improved population health, and apply essential skills such as organizational change leadership and project management.

## Degrees Offered

- Health Informatics, MS (<https://catalogs.northwestern.edu/sps/graduate/health-informatics/health-informatics-ms/>)
- Health Informatics, MS Clinical Informatics Specialization (<https://catalogs.northwestern.edu/sps/graduate/health-informatics/health-informatics-ms-clinical-informatics-specialization/>)
- Health Informatics, MS Health Administration Informatics Specialization (<https://catalogs.northwestern.edu/sps/graduate/health-informatics/health-informatics-ms-administration-specialization/>)
- Health Informatics, MS Health Technology Informatics Specialization (<https://catalogs.northwestern.edu/sps/graduate/health-informatics/health-informatics-ms-technology-specialization/>)

## Health Informatics Courses

### MHI 401-DL American Health Care System (1 Unit)

Provides knowledge of the key components of health care in the US—the policy, economic, and societal forces that shape health care delivery. 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.

### MHI 402-DL Introduction to Clinical Thinking (1 Unit)

Provides insight into the clinical care process. Designed for students not previously involved in clinical medicine as a nurse, pharmacist, or physician, as well as those trained in medicine outside the U.S. Includes basic medical terminology and introductory psychophysiology. Topics

include eliciting information from patients, synthesizing history and physical examination, decision making for ordering tests, establishing diagnoses, treatment planning, integrating evidence-based medicine, and using an intelligent medical record in a complex environment.

### MHI 403-DL Fundamentals of Health Informatics (1 Unit)

The course is an introductory survey of fundamentals of health information technology. Topics center on how information technology enables patient care, how information technology is used by healthcare providers and caregivers, and its use to fuel modern health care organizations. This course provides an overview of health informatics with emphasis on the factors that helped create and sustain this new field, the key players involved, and the impact health information technology is having on the delivery of care in a rapidly changing healthcare marketplace.

### MHI 404-DL Health Care Organization Operations (1 Unit)

Examines the entire information technology needs of every part of hospital organization and management, including patient access services, ambulatory care, clinical practice and organization, nursing services, managing facilities and resources, personnel and staffing, and finance.

### MHI 405-DL HIT Standards and Interoperability (1 Unit)

This course provides concepts and practical examples of health care information interoperability, standard terminologies, messaging standards, health information exchanges (HIEs), and projects deploying these capabilities. Topics covered by the course include the importance of standards; information architecture and application programming interfaces (APIs); principles and examples of standard terminologies; current messaging standards; and their use in health information exchanges for coordination of care and payment reform. Core principles, challenges, benefits, and limitations will be discussed in each of these topics.

### MHI 406-DL Decision Support Systems and Health Care (1 Unit)

This course provides an introduction to decision analysis with an emphasis on medical decision-making and elements of human cognition under uncertainty. Topics include structuring decision problems and developing creative decision options, quantifying uncertainty and preferences, and combining them to arrive at optimal decisions. Also provides the foundation needed to apply the methods of decision analysis in decision support systems and intelligent systems. Students become familiar with the graphical display of medical information, decision analysis and modeling, evidence-based medicine, Bayes' theorem, knowledge-based systems, learning systems, lexicons, coding and structured data entry, and data mining techniques.

### MHI 407-DL Legal, Ethical, and Social Issues (1 Unit)

This course addresses the legal, ethical, and social issues in health care informatics and will equip students with the knowledge and analytic tools needed to spot those key issues, thereby better protecting students and their employers in the medical informatics field. The health care industry is highly regulated, and this course also covers regulatory informatics requirements as they apply to work with health care data and information management systems. The course also covers topics such as privacy and security, fraud and abuse, confidentiality, antitrust law, intellectual property, the Joint Commission, disclosure, and compliance programs.

### MHI 408-DL Information System Acquisition & Lifecycle (1 Unit)

A practical course on acquiring and assessing new medical technology, either as a vendor who needs to know how to meet the expectations of customers and their acquisition requirements or as a customer/practitioner who must know how to validate technology selections and implementations. Topics include cost analysis and justification, economic models, capital purchase, leasing strategies, the application

service provider or risk-sharing model, purchase agreements and contracts, writing a RFP, analyzing a RFP response, and industry business trends.

**MHI 409-DL Introduction to Biostatistics (1 Unit)**

This course is designed for the biomedical researcher. Topics include descriptive statistics, hypothesis testing, estimation, t-tests, chi-squared tests, analysis of variance, linear regression, correlation, and nonparametric tests. Biomedical applications are discussed for each topic, as well as overall application of statistical methods in the informatics field. There are no prerequisites for this course.

**MHI 413-DL Consumer Digital Health (1 Unit)**

This course introduces the emerging practice area of Consumer eHealth, the aim of which is to empower consumers to better manage and influence their health and wellness, access healthcare services, and improve interactions with their caregivers by leveraging digital health solutions and services. Topics include solutions that emphasize the consumer experience (CX), new consumer access models and modalities, consumer-oriented technologies and systems such as APPs and health and wellness devices and platforms, HIPAA-compliant cloud based services, the use of innovative wearables (i.e., electronic tattoos), internables/ingestibles and consumables, and behavioral management solutions such as Digiceuticals and PHRs.

**MHI 414-DL Emerging Federal Regulation & Policy (1 Unit)**

Emerging Federal Regulation & Policy.

**MHI 480-0 Health Analytics and Leadership (1 Unit)**

Health Analytics Leadership.

**MHI 498-DL Capstone Project (1 Unit)**

As a culminating experience, students will put into practice the knowledge and skills they have learned during their coursework through a Capstone Project. Students will have the opportunity to develop and implement a Health Informatics project with an industry or university partner or in their workplace. Alternatively, students can develop a culminating, two-part project. This alternative capstone project will leverage health informatics to provide an innovative, consultative response to a need or problem arising as part of a real-world case study. The project will challenge each student to conduct and integrate comprehensive research and to apply knowledge, skills, and competencies built through coursework they have completed in the MHI program.

**MHI 590-0 Thesis Research (1 Unit)**

This final project is meant to represent the culmination of students' experience in the program and must demonstrate mastery of the curriculum and ability to conduct sustained independent research and analysis. The project may be applied or may be a traditional scholarly paper, in both cases a write-up following the paper's program-specific guidelines is required. Students must submit a proposal and secure a first reader in order to register; for further details students are advised to review the student handbook and contact their academic adviser.

**Prerequisite:** Completion of all core courses in the student's graduate program and specialization.