HEALTH INFORMATICS (MHI)

MHI 5070 Introduction to Health Informatics — 3 credits
A comprehensive introduction to health informatics concepts and applications. Topics include: introduction to data, information, and knowledge; electronic health records; interoperability of health systems; interface and reference terminologies, and classification systems; patient safety; public health informatics; clinical decision support systems; electronic prescribing. Being a very fluid field, new and current topics in health informatics will be introduced during each term as necessary. Must be taken the first semester of enrollment in the MHI program.

MHI 5090 Cyber Security in Health Information Systems — 3 credits
Examination of compliance, ethics, privacy, confidentiality, and security of data in health information systems. Issues related to transmission and exchange of electronic health information across health care systems will also be discussed as well as reviewing Office of Inspector General and Office of Civil Rights violations cases.
Prerequisite with concurrency: MHI 5070.

MHI 5110 Applied Health Care Database Principles — 3 credits
The explosion in generation of health care data in recent years has given rise to the critical need to store, retrieve, and analyze the data in meaningful and efficient ways. This course introduces the students to the basic principles of database theory, modeling, design, and manipulation of databases in the health care domain. Using a Graphical User Interface (GUI), the relational database management system (RDBMS) will be explored using a variant of the Structured Query Language (SQL). Students will be able to create and evaluate query methods and results in the health care context.
Prerequisite: MHI 5070.

MHI 5130 Quality Measurement and Management in Healthcare — 3 credits
One cannot improve what one cannot measure. Quality measures are tools that assist in the quantification of health care outcomes, costs, processes, and accountability. These measures are assessed against standard goals for health care providers. As a data-driven discipline, an understanding of the use and application of quality measures is central to the work of the informatics practitioner. In this course, students will be exposed to a wide range of quality measures and explore associated issues related to data collection, validation, verification, analysis, and reporting.
Prerequisite with concurrency: MHI 5070.

MHI 5150 Programming in Python 3 — 2 credits
Released in 2008, Python 3 is a very powerful language for extracting, manipulating, and cleaning data. Tailored for students with none to limited programming experience, this course will introduce the students to basic concepts in Python 3 with applications in health care. Topics include basic data types and program constructs; expressions; branching; looping; and strings.
Prerequisite: Admission to MHI program.

MHI 5170 Population Health Informatics — 3 credits
This course provides Health Informatics and its application to population health. Technologies to collect and manage population-base datasets, and merging of these large data sets with clinical data for surveillance and other public health utilities will be presented. Students will have the opportunity to access and examine publicly-available health care data sets.
Prerequisite: Admission to the MHI program.

MHI 5210 Project Management and Implementation — 2 credits
In today's rapidly changing and competitive health care landscape, many organizations are continuously integrating health information technology (HIT) and data management initiatives into organizational strategies. Project management skills are increasingly important in the healthcare environment to meet goals, create value, and effectively communicate, develop, and deliver solutions. In this course students will learn the basics of project management and how to apply these techniques in the health care field. This includes how to maximize a health care organization's time, money, and resources, using tools such as task definition and sequencing, creating and adhering to schedules and milestones, as well as taking stakeholder requirements into consideration.
Prerequisite: Admission to the MHI Program.

MHI 5230 Health Care Data Analytics — 3 credits
This foundational course discusses elemental components of data acquisition, retrieval, cleaning, and analysis. Descriptive and predictive statistical methodologies are presented and their utility for testing hypotheses and significance testing will be discussed. The publically-available R language will be taught and used in this course for statistical analysis and reporting, as well as basic data visualization techniques for quick consumption of large amounts of information in a visual manner.
Prerequisite: MHI 5070.

MHI 5250 Data Visualization — 2 credits
A picture is worth a thousand words! In this course the students will learn data visualization theories, principles, methods, and techniques. Students will also learn appropriate techniques and methods for various situations, with applications in the health care arena. A combination of lecture and hands-on programming exercises for creating visualizations will be an integral part of this course.
Prerequisite: MHI 5070.
Recommended: MHI 5150, MHI 5230.

MHI 5270 Human Factors in Health Information Technology — 2 credits
A comprehensive introduction to the concepts of human factors in healthcare information technology. This course will explore the evaluation, usability, cognitive research, and application of design with human factors evaluation and design of health information technology. The course will explore the foundations of system design, concepts of system usability, usefulness, and efficiency, a review of the positive and negative impacts to end users with different design structures. The course will explore the relationship of how health informatics and data analysis can help inform system design and redesign for safety, quality, and research. New and current topics in human factors in healthcare technology will be introduced each term as topics and information evolve.

Prerequisite: MHI 5070 or program director's permission.

MHI 5290 Applied Research Practicum — 3 credits
This course provides students with the opportunity to integrate their learning across the MHI Program by applying health informatics theories and methods, during a practicum experience, to complete a project. The project will be accomplished in collaboration with a community or industry partner. Project results are submitted to the advisor and community/industry partner, presented publicly, and written into a formal academic report. The project is assessed by how well it reflects the student's ability to analyze, interpret, and visualize data for a specified scope of work and effectively present those findings to the partners.
Prerequisite: MHI 5070 or instructor's permission.