Health Informatics (HI)

Courses

HI 5500 U.S. Health System: 3 semester hours.
A comprehensive overview of the U.S. Healthcare System including an introduction of health and disease, health professions, types of healthcare organizations and settings, health populations, regulation, medical terminologies, knowledge and classification systems, as well as an introduction to revenue cycle, billing, coding and reimbursement. F, S.

HI 5520 Health Informatics: 3 semester hours.
Presents an overview of the evolution of health care informatics. Students will learn health care informatics history, concepts, theories, legal and ethical implications, and applications within the health care industry. This course will introduce the student to human factors issues in health care informatics; critical issues affecting the development and implementation of information technologies (clinical, administrative, and learning), knowledge management principles, professional practice trends, and explore some of the emerging information technology in health care.

HI 5522 Health Information Governance: 3 semester hours.
This course will introduce students to the importance of information governance and security requirements in healthcare and the regulatory environment in which healthcare organizations operate. Issues relating to privacy and security, information governance, data quality management and business intelligence will also be covered. Students will also be exposed to interventions that can help mitigate the risks. Specific, evaluated graduate-level activities and/or performances are identified in the course syllabus. PREREQ: HI 5520

HI 5524 Healthcare Workflow Process: 3 semester hours.
The aim of this course is to provide a broad-based understanding of workflow processes in the healthcare industry. In particular, the course will develop skills necessary to critically analyze and redesign the patient flow processes and utilize health IT systems both in the administrative and clinical landscape to achieve greater operational efficiency and provide higher quality of care to patients. Quality improvement methods and tools as well as process change implementation, improvement, and management will also be discussed in this course. Specific, evaluated graduate-level activities and/or performances are identified in the course syllabus. PRE-or-COREQ: HI 5520.

HI 5526 Health Data Analytics: 3 semester hours.
This course will provide an overview of the entire data analysis process from needs analysis to presentation of findings. Students will be introduced to data analytics concepts, frameworks and methodologies used to identify trends, correlations to outcome prediction used to provide meaningful recommendations. Specific, evaluated graduate-level activities and/or performances are identified in the course syllabus. PREREQ: HI 5520, S

HI 5528 Consumer Behavior Theory & Technology: 3 semester hours.
This course will introduce students to theories associated with consumer health behavior and the importance of these theories in developing interventions and health informatics systems to promote healthy behaviors. Determinants and factors leading to non-compliance and lack of engaging in preventative medicine and behavior change strategies will be examined.

HI 5529 Enhancing the Patient Experience & Satisfaction: 3 semester hours.
Patient experience and satisfaction has become a growing priority in healthcare, driven by factors such as policy healthcare regulation and reimbursement. A positive patient and family experience is key to the successful delivery of healthcare services. This course will introduce concepts of patient experience and satisfaction and the impact of patient experience on satisfaction and enhanced patient outcomes.

HI 5530 Health Informatics Application Development: 3 semester hours.
This course will prepare students to design, develop, test and implement Health Informatics applications and support existing applications. Concepts of computer science, information science, information systems, systems analysis and design, application development and computer programming will be covered. Students will study Human Factors, Human-Computer Interaction (HCI), User Interface Design (UCI), QA Testing & amp; Debugging, and Dissemination and Implementation Science theory necessary for the development of effective Health Information applications.

HI 5534 Data Visualization: 3 semester hours.
This course will introduce data visualization and display techniques designed to enhance decision-making. Students will be introduced to software supporting visualization of data for analysis.

HI 5540 Fundamentals of Rural Healthcare: 3 semester hours.
A study of the fundamentals, issues and trends of rural healthcare and delivery of healthcare to underserved populations. The course will provide a conceptual foundation of rural health practices. Students will be introduced to fundamental social, economic and political determinants of health in rural settings and barriers to rural healthcare. S

HI 5542 Rural Health Research and Community Enrichment: 3 semester hours.
This course provides students with the knowledge and skill to conduct and assess rural healthcare research designed to enrich rural communities. Assessing the needs of rural communities, conducting robust empirical research studies, developing instruments and analysis of research data will be covered. PREREQ: HI 5540. S

HI 6528 Electronic Health Records & Decision Support Systems: 3 semester hours.
Introduces students to Electronic Health Records (EHRs) and Decision Support Systems (DSSs) used in healthcare. Students will learn the technical infrastructure of EHRs and DSSs, including distributed architecture, network and security design and configuration approaches to support these designs. The course will also discuss best practices for selecting, deploying and transitioning to EHRs. Students will have hands-on experience with EHR/DSS systems commensurate with different user roles across a variety of healthcare settings. S

HI 6540 Health Informatics Internship: 3 semester hours.
Provides the students with the opportunity to observe and perform various supervised health informatics-related activities in one or more clinical departments. 180 hours per semester required. NOTE: Some healthcare organizations may require a background check, immunizations and/or drug and alcohol testing. These items will be at the student's expense. S

HI 6610 Qualitative Research Methods in Healthcare: 3 semester hours.
The purpose of this course is to provide students with a working knowledge of empirical qualitative research concepts, methods and qualitative data analysis skills necessary to carry out rigorous qualitative research projects. The course will review approaches to establishing research objectives, data collection and qualitative data analysis techniques. S

HI 6612 Scientific Writing and Publication: 3 semester hours.
This course provides an overview of the process of publishing healthcare research findings. The course will introduce key aspects of scientific writing and preparing a research manuscript. The course will consist of didactic lectures regarding approaches and potential problems when writing specific sections of a scientific manuscript. Students will be required to prepare a manuscript and peer review other students? manuscripts. S

HI 6620 Evaluation & Implementation Methods in Healthcare: 3 semester hours.

This course will examine health informatics as an empirical science, focusing on the evaluation of formal studies of applications of applying information technology to healthcare. After completing this course, students will be able to define and use appropriate research evaluation methods and design and conduct informatics research studies appropriate to informatics needs within various healthcare settings. PREREQ: HI 5520. S

HI 6625 Social and Behavior Aspects of Healthcare: 3 semester hours.

Introduction to the effects of social, behavioral, legal, psychological and cognitive theories, methods and models applicable to health informatics from multiple levels including individuals, social groups and society. Student will be introduced to use of social determinants of health and patient-generated data necessary to analyze problems arising from health or disease. Upon completion of the course, students will be able to recognize the implications of these problems on daily activities, recognize and/or develop practical solutions to manage these problems, and apply diverse foundational concepts to develop integrative approaches to the design, implementation and evaluation of health informatics solutions. PREREQ: HI 5500; PRE- or COREQ HI 5520. S

HI 6627 Consumer Health Informatics: 3 semester hours.

Consumer Health Informatics provides consumers with information and tools to empower patients and facilitate patient engagement. This course will provide students with knowledge and skills necessary to assess consumer health needs and resources, evaluate consumer-based informatics tools and select appropriate design, implementation and evaluation approaches for Consumer Health Informatics systems. PREREQ: HI 5520, S

HI 6631 Healthcare Database Design: 3 semester hours.

This course introduces the student to multiple healthcare databases. The student will study the design and development of multi-user relational databases, relational database management systems, stored procedures, SQL and transaction processing. The course emphasizes data security, secure design elements and architectures to ensure privacy and security of healthcare data required by the HIPAA regulation. PREREQ: HI 5530, F, S

HI 6635 Health Information Systems & Interoperability: 3 semester hours.

This course will provide an overview of concepts and frameworks associated with health information system interoperability. Students will be introduced to elements of information technology systems needed to facilitate interoperability and data exchange that enable systems within and across organizational boundaries in order to advance effective delivery of healthcare for individuals and communities. Levels of interoperability, data exchange schema, standards and frameworks such as HL7 and FHIR will be covered. PREREQ: HI 5520. F, S

HI 6636 Natural Language Processing: 3 semester hours.

This course will examine Natural Language Processing (NLP) concepts and the application of NLP methods and applications used to explore meaning of health information. This hands-on course will prepare students to develop NLP systems using linguistic knowledge, information retrieval and extraction, text corpuses and entity recognition techniques to solve health informatics problems. PREREQ: HI 5520 and HI 5530. S

HI 6637 Fundamentals of Population Health: 3 semester hours.

This course explores the broad field of population health including public health, prevention, social medicine, evidence-based medicine, health care systems, healthcare finance, global health, and social determinants of health, with an emphasis on helping students understand how systems and the environment influence health and health care delivery. S

HI 6638 Population Health Informatics: 3 semester hours.

This course will introduce students to the emerging science of Population Health Informatics and facilitate the development of skills necessary to analyze and evaluate evidence-based informatics solutions specific to population health management. Students will be exposed to terminology, key concepts and informatics systems designed to enhance health of the general population, including registries, personal health records, mobile health interventions, and telehealth applications. PREREQ: HI 5520 and HI 6637. S

HI 6641 Rural Health Informatics: 3 semester hours.

The study of using healthcare data and implementing health information systems to advance healthcare in rural settings. This course will cover technologies that promote providing and receiving quality healthcare services that serve rural patient populations. Technologies such as telehealth, telemedicine, mHealth, patient education and engagement tools, quality measure reporting and data sharing tools are covered. PREREQ: HI 5540. S

HI 6650 Health Informatics Thesis: 1-6 semester hours.

A Masters Thesis project where the student demonstrates skill and competency in Health Informatics concepts at a graduate level. This course is for students pursuing the thesis option of the MSHI degree. Deliverables of this course include a thesis written report that complies with the ISU Graduate School Thesis and Dissertation Manual as well as passing an oral examination assessed by the thesis committee comprised of qualified healthcare faculty. PREREQ: All HI core and track courses. S

HI 6660 Health Informatics Project: 3 semester hours.

A significant health informatics project where the student demonstrates skill and competency in health informatics concepts at a graduate level. This course is for students pursuing the non-thesis option of the MSHI degree. Deliverables of this course include a formal/professional written report and passing an oral examination, assessed by a committee of qualified healthcare faculty. PREREQ: All HI core and track courses. S

HI 6670 Managing Health Informatics Projects: 3 semester hours.

This course will introduce students to effective project and people management, information technology management and change management, emphasizing application of these concepts to projects within healthcare settings. Students will be introduced to tools required to complete each phase of the project management process throughout the project life cycle. Using experimental activities and case studies, students will acquire skills on the management of diverse teams consisting of individuals (clinicians and IT personnel) who bring different, but necessary skills, when implementing an improvement project. F/S