HEALTHCARE INFORMATICS

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Overview/Rationale
This interdisciplinary master’s degree program is designed to prepare individuals for successful careers in the complex and dynamic field of healthcare information technology (HIT). Graduates of this Master’s program will be well versed in the technical and professional knowledge, concepts, and skills required to excel in today’s technologically-oriented healthcare world.

This program is designed for healthcare professionals (nurses, physicians, physician assistants, pharmacists, technologists, and others) currently working in an HIT setting and Information Technology (IT) professionals. Students will gain the knowledge and skills to make an impact through the use of HIT.

Program Objectives
The Healthcare Informatics program will prepare its graduates to:

• Emerge as leaders of healthcare teams by utilizing leadership skills that prioritize, strategize, manage, and advocate for solutions tailored to organizational needs.
• Effectively advocate for the use of technology in all healthcare settings.
• Engineer innovative solutions with positive and lasting effects on the future of healthcare information technology.
• Create a vision for technology’s use and lead successful projects using best practice approaches.
• Have a positive impact on the quality and efficiency of healthcare delivery.
• Evaluate healthcare organizations’ technology needs and formulate solutions within clinical, operational, and financial constraints.
• Synthesize at leadership and managerial levels the privacy, security, legal, ethical, and social challenges inherent to the HIT industry.
• Act as mediator among clinical, information technology, research, and administrative stakeholders in healthcare settings.
• Acquire practical knowledge and skills.
• Gain an understanding of how information technology, people, health, and the healthcare system interrelate.
• Learn how to use information technology and information management concepts and methods in healthcare delivery.
• Develop the capacity to facilitate communication among healthcare practitioners, administrators, and IT professionals—and recognize the needs and constraints of all sides.
• Collaborate and exchange ideas with other students from a variety of professional backgrounds.

Admissions Requirements
Students will apply through the Graduate Admissions Office of the University and are admitted to the MSHI Program upon review and recommendation of the Admissions Committee based on academic, course prerequisite and professional requirements listed below.

Admission criteria include:

• A bachelor’s degree or its equivalent from an accredited institution and official transcripts from all undergraduate institutions attended.
• A minimum of two years experience in the fields of either healthcare, healthcare information technology, or information technology. This requirement may be waived by the Program Director if other relevant professional or academic experience is demonstrated.

• Minimum GPA of 3.0.

• A one-page personal statement describing career goals and reasons for interest in the program.

• Two letters of recommendation.

• Current curriculum vitae or resume, highlighting relevant experience.

• Personal interview.

• GRE scores are not required, but may be submitted as additional evidence of admissions eligibility.

Degree Requirements
A total of 36 credit hours of graduate coursework are necessary for completion of the program. Those who require the prerequisite courses will need up to three additional credit hours of foundational coursework.

Course Waiver Policy
Upon application, transcripts will be reviewed for possible course waivers. For students transferring from another accredited graduate program, the Program Director will review transcripts and make a determination of course equivalency. A maximum of six credits, plus the foundation courses, can be transferred.

Prerequisite/Foundations Waiver Policy
Students will be evaluated as to their knowledge and experience of information systems and the healthcare industry. Review of transcripts from accredited institution(s) and curriculum vitae for relevant experience will determine whether the student can be waived from the program prerequisites.

Course Requirements

PREREQUISITE/FOUNDATIONS (3 CREDITS)
- HINF 410 Information Technology Overview (3 credits)
- HINF 412 Introduction to Healthcare Information & Technology (1 credit)
- HINF 415 Convergence of Healthcare and Information Technology (3 credits)
- HINF 420 Introduction to the Language and Culture of Healthcare (3 credits)

REQUIRED/CORE COURSES (27 CREDITS)
- HINF 501 Foundations in Healthcare Informatics
- HINF 502 Healthcare Industry and Policy
- HINF 503 Effective Communications
- HINF 504 Business of Healthcare Information Technology
- HINF 550 Workflow Design & Reengineering
- HINF 551 Leading and Influencing with Integrity (WGB 612)
- HINF 552 Evidence Based Practice & Clinical Decision Support
- HINF 601 Health Information Exchange
- HINF 660 Capstone Project

ELECTIVE COURSES (9 CREDITS)
- HINF 600 Special Topics in Healthcare Informatics
- HINF 610 Electronic Health Records
- HINF 611 Project Management
- HINF 612 Emerging Technologies
HINF 613  Legal Aspects of Healthcare Information Technology
HINF 620  Healthcare Information Systems (NU 575)
HINF 621  Database Design (Oracle) (CS 603)
HINF 622  Information Analysis and System Design

Course Descriptions

HINF 410  Information Technology Overview
3 CR
An overview of technologies that support healthcare information systems. This includes system software, system analysis and design, data management, networks and data communication, information processing distribution schemes, information systems architecture, system standards, and security.

HINF 412  Introduction to Healthcare & Information Technology (3 credits)
1 CR
The student will be introduced to the use of information technology within healthcare settings.

HINF 415  Convergence of Healthcare and Information Technology
3 CR
Technology is transforming how healthcare (note: one word, remove space) is delivered and in the process bringing together disparate groups of people to work together collaboratively. This course will provide an overview of information technology including system analysis and design, data and network management, and information systems architecture and how each directly impacts clinical healthcare personnel. The students will also be introduced to the terminology, practices and processes found in clinical and business operations. Communication between direct patient care individuals and technology personnel will be explored and appropriate methods fostered.

HINF 420  Introduction to the Language and Culture of Healthcare
3 CR
Introduction to organization, economic, culture, policy, and terminology of healthcare for non-health professionals. This also introduces the students to fundamental terminology, practices and processes found in clinical and business operations.

HINF 501  Foundations in Healthcare Informatics
3 CR
High level overview of Healthcare Informatics. Overviews of the following topics will be included: administrative and clinical software applications, healthcare systems acquisition, leadership skills, electronic health records, change management and organizational behavior, workflow design and reengineering, communications specific to the information systems leaders, healthcare information exchanges, and evidence based medicine. A high level look at the healthcare industry and recent government mandates will also be explored. Prerequisite: Granted Permission.

HINF 502  Healthcare Industry and Policy
3 CR
An in-depth view of the major players such as hospital, insurance, government, pharmaceutical, and support vendors and information systems role will be discussed. Patient safety, medical error and healthcare quality improvement will be major topics. A portion of this class will deal with current government healthcare policies and mandates (e.g., healthcare reform) and the complexities of application in the current healthcare information systems environment. The class will take an in depth look at the HIPAA regulations such as entity definitions, information disclosures, and privacy notices.
Government mandates which affect privacy, security, and electronic health records will also be discussed.

**HINF 503 Effective Communications**  
3 CR  
In addition to a formal study of various forms of communications, this course will focus on developing oral and written communication skills needed to educate and influence organizational stakeholders and decision-makers to adopt healthcare information systems. Students will hone their communication skills via simulations, in-class presentations, and case studies. Various management methods via Skype, teleconference, and email will also be practiced.

**HINF 504 Business of Healthcare Information Technology**  
3 CR  
Introduces the student to the business of healthcare at both an industry and individual business level. Includes department design, management of capital and operating budgets, budget planning process, strategic planning, and concepts necessary for the preparation and interpretation of financial statements. Additionally, the vendor identification and selection process as well as contract management will be discussed as it pertains to the healthcare environment. Prerequisites: HINF 501 and HINF 502.

**HINF 550 Workflow Design & Reengineering**  
3 CR  
Introduces process mapping and workflow management. The intricacies of observing, recording, analyzing and improving processes within the healthcare setting will be discussed and analyzed. Issues arising from the development, dissemination, implementation, and use of health information technologies (information systems, monitoring systems, etc.) on individuals and organizations will be explored. The concepts of usability, learnability, likeability, ergonomic and universal design of solutions will also be discussed in depth. Social and ethical issues will also be introduced. Prerequisite: HINF 501.

**HINF 551 Leading & Influencing with Integrity**  
3 CR  
Leaders and managers at all levels in organizations must influence others to enable achievement of the organization’s objectives. Leading and influencing with integrity requires understanding of one’s self, other people, the situational and cultural context, as well as both current and future impacts of actions taken. Through course learning experiences students develop individual and organizational strategies to influence others, shape culture, manage change, negotiate, and facilitate employee engagement and performance so organizations can contribute to society in ways that are effective, responsible and sustainable. (course also known as WGB 612).

**HINF 552 Evidence Based Practice & Clinical Decision Support**  
3 CR  
Evidenced based practice (EBP) qualitative and quantitative methodologies will be analyzed within the scope of the healthcare industry. Topics include identification, interpretation, and evaluation of research information sources, research design, data collection, computer-based data analyses, privacy and protection of human subjects. Clinical Decision Support (CDS) technologies which provide tools for the healthcare providers’ decision making will be examined and debated. Data warehouses will also be discussed as it relates to facilitating and optimizing the research methodologies.

**HINF 600 Special Topics in Healthcare Informatics**  
3 CR  
Designated new or occasional courses
that may or may not become part of the department’s permanent course offerings. Prerequisites are established by the department as appropriate for the specific course.

**HINF 601 Healthcare Information Exchange**  
3 CR  
Evaluation and management of health information between healthcare facilities, government agencies, and consumer health records (PHR) including issues, standards, technologies, and system configurations. Electronic health records will be covered conceptually to understand their impact on HIE’s. Technical components (data exchanges, interoperability, data mining and warehouse) as well as policy issues will be discussed and debated. Exploration of the privacy and security aspects regarding electronic health information exchange. Examining current legal requirements driving policies and procedures as well as business and best practices regarding the creation, storage, processing, access, auditing, and utilization of clinical data. Prerequisites: HINF 502 and HINF 552.

**HINF 660 Capstone Project**  
3 CR  
Capstone electives should be taken as one of the last two courses in the students’ program of study, and after students have successfully completed the breadth and integrated core courses. The capstone project involves practical work and research in a major area of healthcare information systems through student-led projects. This course provides an opportunity to integrate knowledge gained in the classroom with a real-world problem. All projects require a weekly seminar and are guided by faculty members who serve as mentors. Projects may be completed on-site within a healthcare facility. Students who currently work in the healthcare industry may develop a capstone at their current place of employment with the approval of the employer. Capstone will be taken as one of the last two courses in the students’ program of study, and after students have successfully completed the required core courses.

**HINF 610 Electronic Health Records**  
3 CR  
This course is designed to provide an understanding of specific skills required to collect and maintain electronic health data in our current technical and political environment. Examines overviews and issues specific to various types of hospital systems; methods used to interface between systems; and operational issues typical of hospital systems. The course also includes a study of controlled medical vocabularies typically used to define various types of health data as well as a survey of existing and evolving government driven standards and regulations.  
Prerequisite: HINF 550.

**HINF 611 Project Management**  
3 CR  
Introduction to managing healthcare information projects, including the development of the project charter and scope with emphasis on developing the competencies and skills required to successfully lead teams of technical, clinical and professional specialists through workflow and work process redesign activities within a healthcare organization or system. Topics also include project initiating, planning and development, project management tools, budgeting, human resource management, project monitoring and controlling and project closure. Advanced level skills in using PM methodologies to create realistic project plans, schedule tasks and resources effectively, appropriately communicate with all stakeholders and derive meaningful milestones deliverables to track and report progress for both simple and complex projects.  
Prerequisite: HINF 503.
HINF 612 Emerging Technologies
3 CR
The concepts and latest progress on emerging technologies such as health exchanges, biometrics, wireless, mobile, and web technologies will be discussed. Biomedical technologies will also be explored. Examines trends and drivers of innovation both generally and in healthcare and how emerging technologies are adapted and evaluated. Introduces how emerging technologies are applied to improve health records, computerized provider order entry (CPOE) systems, regional health information organizations, personal health records, telemedicine, new imaging systems, robotic surgery, pharmacogenomics, and national-level bio-surveillance.
Prerequisite: HIS 550

HINF 613 Legal Aspects of Healthcare Information Technology
This course explores the extent to which law can implement or facilitate sound healthcare policy. The course will cover the following major areas: employment and contract law, patient rights (e.g., provider disclosure), healthcare accountability (e.g., medical error liability), and healthcare access (e.g., universal coverage). Particular attention will be paid to the balancing act between the patient’s desires for available information over the internet with IT security that ensures patient privacy. Topics such as informed consent, electronic records over the internet, remote patient monitoring, and wireless technology privacy concerns will also be discussed.
Prerequisites: HINF 501 and HINF 502.

HINF 620 Healthcare Information Systems
3 CR
An introduction to health information systems as tools for decision making and communication in healthcare. This course builds on prior knowledge of systems theory and utilizes change theory and information processing theory to analyze, manage and evaluate healthcare information. Emphasis is also on the ability to utilize information systems in the delivery of patient care and the exploration of the variety of tools available to assist in the analysis of quality care. (course also known as NU 575)

HINF 621 Database Design (Oracle)
3 CR
Prerequisite: Information Technology Overview or equivalent course.
Discusses goals and techniques in the design, implementation and maintenance of large database management systems: physical and logical organization; file structures; indexing; entity relationship models; hierarchical, network and relational models; normalization; query languages; and database logic (course also known as CS603)

HINF 622 Information Analysis and System Design
3 CR
Prerequisite: Information Technology Overview or equivalent course.
Discusses the design, analysis and management of information systems: system lifecycle management, hardware and software selection and evaluation, the role of information systems in decision support and other functional areas of business, project management, systems development and analysis, module design and techniques to reduce system complexity.