HI-Health Informatics

HI 598. Professional Activity. 0 Hours.
Professional Development experiences associated with the MSHI degree program.

HI 599. Professional Development. 0 Hours.
Professional development experiences associated with the MSHI degree program.

HI 611. Introduction to Health Informatics and Healthcare Delivery. 3-4 Hours.
Overview of history and current status of health information technology (health IT) and health informatics within the US health care system, including approaches for planning, implementing and evaluating health IT and the legal and ethical issues involved in the use of health IT.

HI 613. Analysis and Design of Health Information Systems. 4 Hours.
Concepts, methods, approaches, standards, and tools in analyzing, modeling, designing, and implementing user centered health information systems.

HI 614. Clinical and Administrative Systems. 3 Hours.
Clinical and administrative systems with an emphasis on clinical decision support methods, tools, and systems. Types of methods, tools, and systems used in inpatient and outpatient settings, information flow across systems within healthcare settings, strategies for user-centered design, implementation and evaluation of systems.

HI 617. Principles in Health Informatics. 3-4 Hours.
Underpinnings in Health Informatics policies, practices, and principles; Inter-and intra-organizational application of socio-technical information systems and data to enhance research and practice in healthcare.

HI 618. Research Methods in Health Informatics. 3 Hours.
Fundamental concepts, methods, and approaches of qualitative and quantitative data analysis, including statistical analysis and measurement techniques, for clinical and health informatics.

HI 619. Databases and Data Modeling. 3 Hours.
Concepts of data modeling, database design and administration, data architectures, and data querying for transactional and analytical data systems. Study of various data models with application to health information projects using SQL in current database management systems.

HI 620. Security and Privacy in Health Care. 3 Hours.
Security and privacy issues, legislation, regulations, and accreditation standards unique to the health care domain and relative to various group layers (individual, social, and society). Concepts, theories, methods, models, and tools related to technical security of data across networks, systems, databases and storage, audit mechanisms and controls.

HI 621. Strategic Planning Project Management and Contracting. 3 Hours.
Theory, practice, and processes needed for strategic planning of integrated health information systems. Assessing benefits of enterprise-wide information integration and tactics needed to realize these benefits. Steps needed for developing strategic plans and understanding drivers of information systems - corporate business alignment. Understanding key concepts of project management. Exposure to skills needed to negotiate contracts with vendors.

HI 624. Leadership Theory and Development. 2 Hours.
Exploration of leadership theory and development, and the role of leadership in internal and external advocacy. The emphasis is on the application of leadership theories to individuals and groups in healthcare settings.

HI 633. Artificial Intelligence Methods in Health Services. 3 Hours.
This course focuses on the methods and techniques of artificial intelligence (AI) as applied to health services. Students will delve into supervised and unsupervised learning, deep learning, and reinforcement learning through hands-on applications involving real-world healthcare data. Key technical competencies include data preprocessing, visualization, dimensionality reduction, regression and classification modeling, model evaluation, and optimization.

HI 634. Foundations - Artificial Intelligence in Health Services. 3 Hours.
This course introduces students to the foundational concepts, methods, and applications of artificial intelligence (AI) in health services. Students will gain an overview of machine learning, natural language processing, and data mining as applied to healthcare, while examining data sources, project implementation strategies, and emerging tools. Emphasis will be placed on the ethical, legal, and practical considerations surrounding AI integration in clinical and administrative settings. The course equips students with a broad understanding of AI's capabilities, limitations, and transformative potential in improving health outcomes and operational efficiency.

HI 635. Data Mining, Management, and Modeling for Artificial Intelligence in Health Services. 3 Hours.
This course covers data mining, management, and modeling techniques essential for developing AI solutions in health services. Students will explore data preprocessing, feature selection, database design, and predictive modeling with a strong emphasis on healthcare applications. Topics include relational databases, SQL programming, big data platforms, interoperability standards (such as HL7 and FHIR), and healthcare business intelligence. The course blends theoretical understanding with practical data management and modeling skills to prepare students for data-driven AI development in health systems.

HI 636. Human Factors Considerations for Artificial Intelligence in Health Services. 3 Hours.
This course examines human factors, usability principles, and cognitive ergonomics in the design and implementation of artificial intelligence (AI) systems in healthcare. Students will explore how user-centered design and evaluation strategies can improve the safety, trustworthiness, and effectiveness of AI systems. Special focus will be placed on the unique challenges and opportunities posed by AI interfaces, decision support, automation, and emerging technologies such as large language models.

HI 641. Healthcare Data Analytics Challenges, Methods, and Tools. 3 Hours.
Current factors, methods, and tools affecting data collection, management, analytics, integration, and reporting in healthcare, including use of various ontologies and standards, and healthcare challenges affecting data analytics.

HI 642. Advanced Data Management and Analytics for Healthcare. 3 Hours.
Automation of database management and basic Extract-Transform-Load (ETL) and data analytics tasks using advanced SQL. Creation and optimization of relational databases. Current data modeling and database architecture approaches and their uses in healthcare. Integration of data mining and analytics into database management platforms.
Prerequisites: HI 619 [Min Grade: C]

HI 643. Business Intelligence for Healthcare. 3 Hours.
Current concepts, methods and tools in Business Intelligence for healthcare. Approaches for data modeling for data warehouses, Extract-Transform-Load (ETL) processes, data marts, data integration, and data visualization.
Prerequisites: HI 619 [Min Grade: C] and HI 642 [Min Grade: C]

HI 646. Advanced Quantitative Methods for Health Informatics. 3 Hours.
Concepts, methods, and tools used in advanced quantitative data analytics to address a range of problems in health informatics, including prediction, classification, and pattern recognition across a variety of levels (individual, social group, and society).
Prerequisites: HI 618 [Min Grade: C]

HI 656. Human Factors in Healthcare IT Systems. 3 Hours.
Overview of the importance of human factors engineering in the function of healthcare IT systems and specialized challenges to user experience (UX) research in the context of the healthcare system. Application of user-centered theory, principles, data, and methods to the design of healthcare IT systems. Implementation of UX research methods to evaluate and understand the interactions between healthcare IT systems and their users.

HI 657. Human-centered Research Design Methods for Healthcare. 3 Hours.
Design Thinking methodology intensive. Discussion of the importance of qualitative user research. Understanding of discovery to enable Identification of proper user research approaches and establishing research goals. Overview tools and processes for deep research discovery. Students will select a healthcare context for the application of research methods.

HI 658. Development of User Centered Health Information Systems. 3 Hours.
Development approaches involving principles of human-centered design, leading to high fidelity health information system prototypes.

HI 659. Qualitative Synthesis for Healthcare Insights. 3 Hours.
Overview and execution of qualitative research methods and data gathering within the healthcare context to enable the delivery of solutions. Focus on the application of research theories, methods, and tools to deliver insights and qualitative and quantitative outputs. Understanding socio-technical factors relative to fundamental interface design elements and interface layouts across modalities. Journey mapping, concepting, user flows, and wireframing will be generated.

HI 671. Data Analytics Capstone Project I. 1 Hour.
Initiation of first steps in identifying and developing the HI Capstone Project; the Capstone project is a focused investigation of a health informatics problem in a real-world setting and application of problem-solving methodologies for development and execution of solutions.

HI 672. User Experience Capstone Project I. 1 Hour.
Initiation of first steps in identifying and developing the HI Capstone Project; the Capstone project is a focused investigation of a health informatics problem in a real-world setting and application of problem-solving methodologies for development and execution of solutions.

HI 673. Data Analytics Capstone Project II. 1 Hour.
Continuation course of the HI Capstone Project involving project execution, management, and dissemination; the Capstone project is a focused investigation of a health informatics problem in a real-world setting and application of problems solving methodologies for development and execution of solutions.

HI 674. User Experience Capstone Project II. 1 Hour.
Continuation course for the HI Capstone Project involving project proposal development; the Capstone project is a focused investigation of a health informatics problem in a real-world setting and application of problems solving methodologies for development and execution of solutions.

HI 675. Data Analytics Capstone Project III. 3 Hours.
Final course for the HI Capstone Project involving project execution, management, and dissemination; the Capstone project is a focused investigation of a health informatics problem in a real-world setting and application of problems solving methodologies for development and execution of solutions.

HI 676. User Experience Capstone Project III. 3 Hours.
Final course for the HI Capstone Project involving project execution, management, and dissemination; the Capstone project is a focused investigation of a health informatics problem in a real-world setting and application of problems solving methodologies for development and execution of solutions.

HI 677. Research Capstone Project I. 1 Hour.
Initiation of first steps in identifying and developing the HI Capstone Project: the capstone project is a focused investigation of a health informatics problem in a real-world setting and application of problem-solving methodologies for development and execution of solutions.

HI 678. Research Capstone Project II. 1 Hour.
Continuation course of the HI Capstone Project involving project execution, management, and dissemination; the Capstone project is a focused investigation of a health informatics problem in a real-world setting and application of problems solving methodologies for development and execution of solutions.

HI 679. Research Capstone Project III. 3 Hours.
Final course for the HI Capstone Project involving project execution, management, and dissemination; the Capstone project is a focused investigation of a health informatics problem in a real-world setting and application of problems solving methodologies for development and execution of solutions.

HI 680. Artificial Intelligence Capstone Project I. 1 Hour.
Initiation of first steps in identifying and developing the HI Capstone Project; the Capstone project is a focused investigation of a health informatics problem in a real-world setting and application of problem-solving methodologies for development and execution.

HI 681. Artificial Intelligence Capstone Project II. 1 Hour.
Rigorous project that provides opportunity for focused investigation of a Health Informatics issue in a real-world setting and for application of problem-solving methodologies for development and execution of solutions. Investigation and application of theory through a practical implementation project.

HI 682. Artificial Intelligence Capstone Project III. 3 Hours.
Final course for the HI Capstone Project involving project execution, management, and dissemination; the Capstone project is a focused investigation of a health informatics problem in a real-world setting and application of problems solving methodologies for development and execution of solutions.

HI 685. Principles in Health Informatics. 3-4 Hours.
Underpinnings in health informatics policies, practices, and principles. Inter-and intra-organizational application of information systems and data to enhance research and practice in healthcare.

HI 690. Administrative Internship. 4-8 Hours.
Structured field experiences in health care or other enterprises associated with health care industry. Includes a mentoring relationship with a preceptor and an opportunity for application of information resource management theory and strategies. Foundation for professional development and assists in refining skills and behaviors necessary for successful practice in a complex professional, social, political, and technological environment.

HI 694. Special Topics in Health Informatics. 1-4 Hour.
Study of selected topics in health informatics. May be repeated for credit.

HI 695. Independent Study in Health Informatics. 1-4 Hour.
Opportunity to investigate, perform activities and/or conduct a project related to a narrow topic in Health Informatics that corresponds with the current research of HI faculty, including medical informatics, nursing informatics, computer and communication sciences, library science, etc. May be repeated for credit.

HI 698. Simulation Capstone/Non-thesis Research. 1-8 Hour.
Rigorous culminating project that provides the opportunity for focused investigation of simulation applications in a real-world setting. Investigation and application of theory through a practical project.

HI 699. Master's Level Thesis Research. 4-8 Hours.
Original research in health informatics and interpretation of results. Demonstrates student's acquaintance with literature of field and competency in proper selection and execution of research methodology. Recommended for students planning to pursue a doctoral degree. May be repeated for credit (8 hours maximum credit allowed).
Prerequisites: GAC M

HI 725. Information Systems Theory and Practice. 3 Hours.
Investigation of appropriate research methods to assess theoretical models involving interdependencies and relationships between Information technology, human behavior, and organizational and socio-technical contexts; review of qualitative and quantitative research methods using IS journal article exemplars.

HI 726. Health Information Systems. 3 Hours.
This course introduces the design, implementation, and evaluation of health information systems (HIS). Emphasis is placed on electronic health records (EHRs), interoperability, data governance, and the role of HIS in improving care delivery and patient outcomes.

HI 727. Clinical Operations and Decision Making. 3 Hours.
This course focuses on optimizing healthcare delivery through effective management of clinical operations and data-driven decision-making. Topics include process improvement, resource utilization, quality management, and clinical decision support systems. Students will explore real-world challenges and develop practical skills to enhance patient care, streamline workflows, and implement evidence-based solutions in healthcare settings.

HI 728. Learning and Knowledge Health Systems. 3 Hours.
This course examines the principles and implementation of learning health systems (LHS) and knowledge health systems (KHS), focusing on their role in advancing healthcare quality and outcomes. Students will explore how continuous data-driven learning cycles, evidence generation, and knowledge dissemination improve patient care, inform clinical decisions, and support system-wide innovation.

HI 729. Technology and Society. 3 Hours.
This course explores the complex interactions between technology and society, examining how social norms shape technological advancements, ethics, and policies. Students will analyze the societal impacts of technology, including equity, privacy, and sustainability, while considering strategies for fostering responsible innovation.

HI 777. Mixed Methods Research I. 3 Hours.
Provide introduction to the field of mixed methods research: essence of mixed methods research, rationale for using it, its fundamental principles and key characteristics, major design applications, and means of assessing the quality of mixed methods inferences. Learn how the mixed methods research process is shaped by personal, interpersonal, and social contexts and how mixed methods intersects with other quantitative and qualitative research approaches and designs.