Health Informatics

Degree Offered: M.S.H.I.
Program Director: Sue S. Feldman, RN, MEd, PhD
Phone: (205) 934-3509
E-mail: mshi@uab.edu
Website: www.uab.edu/hi

Master of Science in Health Informatics

Program Admission

Admission to the program is in the fall semester only. Application to the program may be made September through May 31, preceding the expected date of enrollment for the next fall term. Applications received after May 31 are considered on a space-available basis. Applications are evaluated against the Graduate School criteria and those criteria developed specifically for the HI program. The ideal size of each entering class is 30 to 35 students.

Admission Requirements

Admission to the program requires acceptance to the Graduate School of The University of Alabama at Birmingham. Applicants must have completed or anticipate completion of at least a baccalaureate degree from a regionally accredited college or university or from a recognized university abroad before entering the program. As a criterion for unconditional admission, applicants must have no less than a B GPA (3.0 on a 4.0 scale) for the last 60 semester hours of earned undergraduate credit or overall undergraduate credit or overall undergraduate hours. Official transcripts of all previous academic work beyond the secondary level should be submitted. Before matriculation, entering students must have received a final transcript for each degree received.

The applicant should include a carefully drafted statement about his or her personal interests, career goals, and relevant background experience and a professional resume. Three confidential letters of recommendation from individuals qualified to write concerning the applicant's potential for success in both a graduate program and in the Health Informatics field must be submitted.

Prior to entering the program, applicants should have completed three credit hours of undergraduate or graduate course work in statistics and in SQL programming or a relevant continuing education course.

Admission to the MSHI program is determined by an interview process and the consensus of the Admissions Committee. The decision is based on previous academic record, professional recommendations as evidence of ability to perform graduate-level work, and an interview with two faculty members. The program director reserves the prerogative for final recommendation on admission status to the Graduate School.

Applicants accepted to the program may be asked to complete a criminal background check and drug screen at program admission and again prior to clinical placement as required by school policy.

To be considered for early admission, all application materials must be in the Graduate School Office by March 1.

Additional Information

Deadline for Entry Term(s): Fall
Deadline for All Application Materials to be in the Graduate School Office: May 31
Number of Evaluation Forms Required: Three Professional Letters of Recommendation
Entrance Tests: (TOEFL and TWE also required for international applicants whose native language is not English.)
Length of Study: 45 Credit Hours

Program Overview

Based on the needs of health care CIOs, UAB’s MSHI curriculum integrates the domains of information and communication technology, the healthcare delivery process, and leadership and management principles.

This collaborative approach to healthcare IT allows our graduates to understand the complexity of relationships that must be considered when making technology decisions in a healthcare setting.

Our students graduate with a solid understanding of how clinicians and administrators use information and technology in making decisions. With courses in the effective design and use of information systems, databases, software, hardware and networks, students also learn how to successfully manage the flow of information throughout a healthcare organization and the value of building a solid business case for the purchase, implementation, and use of technology in a healthcare setting. Graduates are prepared to become senior and executive level leaders in the healthcare IT industry. Students are exposed to a variety of academic disciplines and gain a broad education that serves as a foundation for them throughout their careers as information and health service executives.

The program is comprised of a core curriculum plus one track of the student’s choosing. The first year of the MSHI core curriculum includes HI 611-Introduction to Health Informatics and the US Healthcare Delivery System, HI 613-Analysis & Design of Information Systems in Healthcare, HI 685 Principles of Health Informatics, HI 614-Clinical & Administrative Systems, HI 618 Research Methods in Health InformaticsHI 618 Research Methods in Health Informatics, HI 619-Databases and Data Modeling, HI 620-Security and Privacy in Healthcare, and HI 621-Strategic Planning, Project Management, and Contracting. During the second year, students complete the MSHI core by taking HI 622-Leadership Theory and Development, , and completing a capstone project (depending on track).

Data Analytics Track

The proliferation of information technology to support workers in the healthcare industry has resulted in a massive amount of healthcare data being generated. While the data are seen as an organizational asset that can both help determine trends and patterns in patient care delivery and increase organizational efficiency, there are very few individuals trained to extract, combine, organize, interpret, and display these data in meaningful ways. This track produces graduates who help healthcare organizations institute data-driven decision-making processes. Beyond that, graduates of this track in the MSHI program are trained to assist organizations with developing data governance strategies, which help them define the way they think about quality, security, access to data, and policies surrounding data.
Courses in the Data Analytics Track include HI 641-Healthcare Data Analytics Challenges, Methods, and Tools, HI 642-Advanced Data Management & Analytics for Healthcare, HI 643-Business Intelligence for Healthcare, HI 646-Advanced Quantitative Methods for Health Informatics, HI 671-Data Analytics Capstone Project I, HI 673 - Data Analytics Capstone Project II, and HI 675 - Data Analytics Capstone Project III.

Entry into this track requires admission to the MSHI Program and completion of the first year MSHI core curriculum. Declaration for this track occurs in the first summer semester of the student’s first year in the program.

User Experience Track

Information technology has facilitated many significant improvements to the way that we deliver patient care. But, most IT solutions currently in use by healthcare organizations were not designed to enable new models of healthcare delivery and will require development of more intuitive interfaces that model the behaviors and needs of patients and clinical end users. New products and software cannot be perceived as too difficult to use, nor can they compromise clinicians’ ability to interact meaningfully with their patients. Graduates of the Healthcare User Experience Track bring an in-depth understanding of a complex healthcare delivery system, the technologies that are required to support patient care delivery, and the understanding of best practices in designing safe, effective, and user-friendly products and software in a healthcare setting.


Entry into this track requires admission to the MSHI Program and completion of the first year MSHI Core. Declaration for this track occurs in the first summer semester of the student’s first year in the program.

Clinical Informatics Graduate Certificate

The Clinical Informatics Graduate Certificate is designed as a high-quality, rigorous educational forum for practicing clinicians interested in advancing their informatics skills. Students will develop a broad understanding of the strategic application of clinical and administrative information systems, the data contained in these systems, and the people and processes required for effective information systems deployment. Expanding the number of clinical professionals who can act as health informatics champions in healthcare organizations is needed to enable achievement of the ‘triple aim’ in healthcare – high quality health care, improved population health, and efficient use of healthcare resources.

The curriculum is delivered online, and is comprised of 15 credit hours (4 courses) that may be completed in two academic terms. Applicants must be admitted to the UAB Graduate School and to the Clinical Informatics Graduate Certificate program.

Additional Information

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<tr>
<th>Requirement</th>
<th>Fulfilled By:</th>
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<tr>
<td>Deadline for Entry Term(s):</td>
<td>Fall</td>
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<td>Deadline for All Application Materials to be in the Graduate School Office:</td>
<td>May 31</td>
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<tr>
<td>Length of Study:</td>
<td>15 Credit Hours</td>
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Contact Information

For detailed information, contact the Program Manager, Misty Altiparmak, Graduate Programs in Health Informatics, UAB School of Health Professions, SHPB 590A. Physical address: 1716 9th Avenue South. Mailing address: 1720 2nd Avenue South, Birmingham, AL 35294 Telephone 205-934-3509 Fax 205-975-6608 E-mail mshi@uab.edu

Graduate Certificate in Clinical Informatics

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Hours</th>
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<tbody>
<tr>
<td>HI 611 Introduction to Health Informatics and Healthcare Delivery</td>
<td>4</td>
</tr>
<tr>
<td>HI 613 Analysis and Design of Health Information Systems</td>
<td>4</td>
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<tr>
<td>HI 614 Clinical and Administrative Systems</td>
<td>3</td>
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<tr>
<td>HI 617 Principles in Health Informatics</td>
<td>4</td>
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<td>Total Hours</td>
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Master of Science in Health Informatics

The MSHI Program follows a Core/Track model which consists of a total of 45 semester hours. 28 semester hours are taken in the core Informatics courses. The remaining 17 semester hours are taken in one of two specialty tracks (Healthcare Data Analytics or Healthcare User Experience).

The MSHI Program allows students to earn only two grades of “C” during their time in the program. Upon earning a third grade of “C,” the student will be dismissed from the program. Any final grade of “D” or below in any course will result in dismissal from the program.

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<tr>
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<td>HI 614 Clinical and Administrative Systems</td>
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<td>HI 617 Principles in Health Informatics</td>
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<td>HI 618 Research Methods in Health Informatics</td>
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<td>HI 619 Databases and Data Modeling</td>
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<td>HI 620 Security and Privacy in Health Care</td>
<td>3</td>
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<td>HI 621 Strategic Planning Project Management and Contracting</td>
<td>3</td>
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<tr>
<td>HI 622 Financial Management for Health Professionals</td>
<td>2</td>
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<td>Total Hours</td>
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Healthcare Data Analytics Track

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<th>Requirements</th>
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<tr>
<td>HI 641 Healthcare Data Analytics Challenges, Methods, and Tools</td>
<td>3</td>
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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 622. Financial Management for Health Professionals. 3 Hours.
Financial statements, cost allocation, capital budgeting, time value analysis, reimbursement, financial risk and return, long-term debt financing, capital structure, cost of capital, and analysis of financial performance.

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 630. Strategic Planning and Contracting for Health Information Systems. 4 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 that are aligned with goals of health care institutions using case studies and in team projects. Development of a Request for Proposal (RFP) based on strategic plans. Critique and practice of skills needed to negotiate contracts with vendors.

HI 632. Quantitative Methods for Health Informatics. 3 Hours.
Selected mathematical and statistical techniques and computer applications applied to decision making in hospitals and health care organizations. Introduction to selected analytic and visualization software and techniques used to measure and evaluate healthcare outcomes.
HI 640. Intro to Health Informatics and Health Care Delivery. 3-4 Hours.
History and current status of information systems in health care and health care information systems. Information architectures, administrative and clinical applications, strategic planning, security, and benefits realization.

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 650. Foundations of Healthcare User-Based Design. 3 Hours.
Exploration of models of cognition and human performance and their application to healthcare information, patient safety, and technology.

HI 651. Foundations of Healthcare User-Based Research. 3 Hours.
Overview of interaction design research theories, implementation models and assessment of end-user mental models. Designing for healthcare teams, workflow considerations, contextual inquiry and distributed cognition models. Emphasis on analysis of modeling users, designing scenarios and requirements, and incorporating qualitative and quantitative research methods into the design of healthcare IT products and services; usability testing, heuristic evaluations, and web analytics.

HI 652. Design Thinking for Healthcare. 3 Hours.
Methodological approaches to principles of human-centered design, including quantifying end-user satisfaction with a healthcare-related device or interface, iterative prototyping, developing integrative thinking and empathy within a multi-disciplinary organization, contextual inquiry, brainstorming techniques and end-to-end walk-throughs.

HI 653. Managing the User-Centered Development Process. 3 Hours.
Methodological approaches to principles of human-centered design, including quantifying end-user satisfaction with a healthcare-related device or interface, iterative prototyping, developing integrative thinking and empathy within a multi-disciplinary organization, contextual inquiry, brainstorming techniques and end-to-end walk-throughs.

HI 654. Healthcare User Experience Capstone Project. 1-5 Hour.
Rigorous project that provides opportunity for focused investigation of User Experience problem in real-world setting and for application of problem solving methodologies for development and execution of solutions. Investigation and application of theory through practical implementation project.

HI 655. 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 660. Healthcare Requirements Analysis. 3 Hours.
Approach to, identification, documentation and presentation of common health informatics problems. A focus on identifying root problems and unambiguous metrics for post-evaluation to ensure final deliverable meets intended need. Exposure to project management methodologies and six sigma processes to facilitate the logic needed for troubleshooting data problems in healthcare.

HI 661. Advanced Database Design and SQL for Healthcare. 3 Hours.
Study of common healthcare data structures and environments. Creation of database components; in-depth SQL coding; data warehouse designs; tools such as TOAD, SQL Explorer, Management Studio.

HI 662. Healthcare Business Intelligence. 3 Hours.
Exposure to typical business intelligence (BI) tool sets and identification of business objects. Building of the metalayer involved in a business intelligence system and exposure to Business Objects, Crystal Reports, SSRS.

HI 664. Data Analytics Capstone Project. 1-5 Hour.
Rigorous project that provides opportunity for focused investigation of healthcare data problems in real-world settings and for application of problem-solving methodologies for development and execution of solutions. Investigation and application of theory through practical implementation project.
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 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 686. Leadership Theory. 1 Hour.
Exploration of the theoretical nature of leadership. Emphasis is on the application of theories of leadership in healthcare settings.

HI 687. Leadership Development. 1 Hour.
Completion of a guided leadership inventory, guest lecturers from industry leaders across multiple disciplines in healthcare to provide context-specific insight on leadership topics.

HI 688. Leadership Advocacy. 1 Hour.
Understanding internal and external advocacy relationships, practices and resources in the field of health informatics and information management.

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.