Health Informatics

Prospective students should use this checklist (http://www.uab.edu/graduate/images/acrobat/checklist/hlthinformatics.pdf) to obtain specific admissions requirements on how to apply to Graduate School.

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. Application to the program may be made September through April 30, preceding the expected date of enrollment for the next fall term. Applications received after April 30 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 20 to 25 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 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 must complete a criminal background check and drug screen at program admission and again prior to clinical placement as required by school policy.

Additional Information

Deadline for Entry Term(s): Fall
Deadline for All Application Materials to be in the Graduate School Office: June 1
Number of Evaluation Forms Required: Three
Entrance Tests: (TOEFL and TWE also required for international applicants whose native language is not English.)
Comments: None

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 640-Introduction to Health Informatics and the US Healthcare Delivery System, HI 600-Anlysis & Design of Information Systems in Healthcare, HI 601-Databases and Data Modeling, HI 602-Clinical & Administrative Systems, HI 630-Strategic Planning and Contracting, HI 620-Security and Privacy in Healthcare. During the second year, students complete the MSHI core by taking HI 686-Leaderhip Theory, HI 687-Leadership Development and HI 688-Leadership Advocacy.

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 632-Quantitative Methods for Health Informatics, HI 660-Advanced Requirements Analysis, HI 661-
Advanced Database Design and SQL for Healthcare, HI 662-Healthcare Business Intelligence and HI 664-Data Analytics Capstone Project.

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 (IT) 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. Graduates of the program will be eligible to sit for the Clinical Informatics Subspecialty Board Examination offered by the American Board of Preventive Medicine and the American Board of Pathology. Applicants must be admitted to the UAB Graduate School and to the Clinical Informatics Graduate Certificate program.

Contact Information

For detailed information, contact the Admissions Coordinator, Master of Science in Health Informatics Program, UAB School of Health Professions, SHPB 590A. Physical address: 1705 University Blvd. 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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</thead>
<tbody>
<tr>
<td>HI 640 Intro to Health Informatics and Health Care Delivery</td>
<td>4</td>
</tr>
<tr>
<td>HI 600 Analysis and Design of Health Information Systems</td>
<td>4</td>
</tr>
<tr>
<td>HI 602 Clinical and Administrative Systems</td>
<td>3</td>
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<tr>
<td>HI 685 Principles in Health Informatics</td>
<td>4</td>
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<tr>
<td><strong>Total Hours</strong></td>
<td><strong>15</strong></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. 27 semester hours are taken in the core Informatics courses. The remaining 18 semester hours are taken in one of 2 specialty tracks (Healthcare User Experience, Healthcare Data Analytics.)

The MSHI Program allows students to earn only two grade 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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<thead>
<tr>
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<tr>
<td>HI 640 Intro to Health Informatics and Health Care Delivery</td>
<td>4</td>
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<tr>
<td>HI 600 Analysis and Design of Health Information Systems</td>
<td>4</td>
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<tr>
<td>HI 602 Clinical and Administrative Systems</td>
<td>3</td>
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<tr>
<td>HI 601 Databases and Data Modeling</td>
<td>3</td>
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<tr>
<td>HI 630 Strategic Planning and Contracting for Health Information Systems</td>
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<td>HI 620 Security and Privacy in Health Care</td>
<td>4</td>
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<tr>
<td>HI 686 Leadership Theory</td>
<td>1</td>
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<td>HI 687 Leadership Development</td>
<td>1</td>
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<td>HI 688 Leadership Advocacy</td>
<td>1</td>
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<tr>
<td>HI 685 Principles in Health Informatics</td>
<td>3-4</td>
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<tr>
<td><strong>Total Hours</strong></td>
<td><strong>28-29</strong></td>
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Healthcare User Experience Track

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<tr>
<th>Requirements</th>
<th>Hours</th>
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<tbody>
<tr>
<td>HI 650 Foundations of Healthcare User-Based Design</td>
<td>3</td>
</tr>
<tr>
<td>HI 651 Foundations of Healthcare User-Based Research</td>
<td>3</td>
</tr>
<tr>
<td>HI 652 Design Thinking for Healthcare</td>
<td>3</td>
</tr>
<tr>
<td>HI 653 Managing the User-Centered Development Process</td>
<td>3</td>
</tr>
<tr>
<td>HI 654 Healthcare User Experience Capstone Project</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td><strong>18</strong></td>
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Healthcare Data Analytics Track

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<tr>
<th>Requirements</th>
<th>Hours</th>
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<tbody>
<tr>
<td>HI 660 Healthcare Requirements Analysis</td>
<td>3</td>
</tr>
<tr>
<td>HI 661 Advanced Database Design and SQL for Healthcare</td>
<td>3</td>
</tr>
<tr>
<td>HI 662 Healthcare Business Intelligence</td>
<td>3</td>
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<tr>
<td>HI 632 Quantitative Methods for Health Informatics</td>
<td>3</td>
</tr>
<tr>
<td>HI 664 Data Analytics Capstone Project</td>
<td>6</td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td><strong>18</strong></td>
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Courses

HI 600. Analysis and Design of Health Information Systems. 4 Hours. Requirements, concepts, methods, and tools in analyzing, modeling, and designing health information systems with emphasis on clinical systems.

HI 601. Databases and Data Modeling. 3 Hours. Concepts of data modeling, data architectures, and data administration. Study of various models with application to current health information projects. One hour required weekly in Health Informatics Computer Lab applying database skills.

HI 602. Clinical and Administrative Systems. 3 Hours. Foundations of clinical information use starting with information collection, processing (e.g., decision making) and recording. All aspects of clinical information use in inpatient and outpatient facilities. Special emphasis on the clinician's work to support enterprise-wide health care delivery.


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 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.

Prerequisites: HI 600 [Min Grade: C] and HI 601 [Min Grade: C] and HI 602 [Min Grade: C] and HI 620 [Min Grade: C] and HI 630 [Min Grade: C] and HI 640 [Min Grade: C]

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.

Prerequisites: HI 600 [Min Grade: C] and HI 601 [Min Grade: C] and HI 602 [Min Grade: C] and HI 620 [Min Grade: C] and HI 630 [Min Grade: C] and HI 640 [Min Grade: C]

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.

Prerequisites: HI 600 [Min Grade: C] and HI 601 [Min Grade: C] and HI 602 [Min Grade: C] and HI 620 [Min Grade: C] and HI 630 [Min Grade: C] and HI 640 [Min Grade: C] and HI 650 [Min Grade: C] and HI 651 [Min Grade: C]

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.

Prerequisites: HI 600 [Min Grade: C] and HI 601 [Min Grade: C] and HI 602 [Min Grade: C] and HI 620 [Min Grade: C] and HI 630 [Min Grade: C] and HI 650 [Min Grade: C] and HI 652 [Min Grade: C] and HI 653 [Min Grade: C] and HI 654 [Min Grade: C] and HI 655 [Min Grade: C]

HI 654. Healthcare User Experience Capstone Project. 1-6 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.

Prerequisites: HI 600 [Min Grade: C] and HI 601 [Min Grade: C] and HI 602 [Min Grade: C] and HI 620 [Min Grade: C] and HI 630 [Min Grade: C] and HI 640 [Min Grade: C] and HI 650 [Min Grade: C] and HI 652 [Min Grade: C] and HI 653 [Min Grade: C] and HI 654 [Min Grade: C] and HI 655 [Min Grade: C]

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.

Prerequisites: HI 600 [Min Grade: C] and HI 601 [Min Grade: C] and HI 602 [Min Grade: C] and HI 620 [Min Grade: C] and HI 630 [Min Grade: C] and HI 640 [Min Grade: C]

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.

Prerequisites: HI 600 [Min Grade: C] and HI 601 [Min Grade: C] and HI 602 [Min Grade: C] and HI 620 [Min Grade: C] and HI 630 [Min Grade: C] and HI 640 [Min Grade: C] and HI 646 [Min Grade: C] and HI 687 [Min Grade: C]

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

Prerequisites: HI 600 [Min Grade: C] and HI 601 [Min Grade: C] and HI 602 [Min Grade: C] and HI 620 [Min Grade: C] and HI 630 [Min Grade: C] and HI 632 [Min Grade: C] and HI 640 [Min Grade: C] and HI 660 [Min Grade: C]
HI 664. Data Analytics Capstone Project. 1-6 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.

**Prerequisites:** HI 600 [Min Grade: C] and HI 601 [Min Grade: C] and HI 602 [Min Grade: C] and HI 620 [Min Grade: C] and HI 630 [Min Grade: C] and HI 632 [Min Grade: C] and HI 640 [Min Grade: C] and HI 660 [Min Grade: C] and HI 661 [Min Grade: C] and HI 662 [Min Grade: C]

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.

**Prerequisites:** HI 600 [Min Grade: C] and HI 601 [Min Grade: C] and HI 620 [Min Grade: C] and HI 630 [Min Grade: C] and HI 640 [Min Grade: C]

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.

**Prerequisites:** HI 600 [Min Grade: C] and HI 601 [Min Grade: C] and HI 602 [Min Grade: C] and HI 620 [Min Grade: C] and HI 630 [Min Grade: C] and HI 640 [Min Grade: C]

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

**Prerequisites:** HI 600 [Min Grade: C] and HI 601 [Min Grade: C] and HI 602 [Min Grade: C] and HI 620 [Min Grade: C] and HI 630 [Min Grade: C] and HI 640 [Min Grade: C]

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. Master's Level Non-Thesis Research. 2-8 Hours.
Focused investigation of informatics problem in real-world setting and for application of problem solving methodologies for development and execution of solutions.

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 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.