HEALTH SCIENCES INFORMATICS, PHD

The Ph.D. offers the opportunity to participate in ground breaking research projects in clinical informatics at one of the world’s finest medical schools. In keeping with the tradition of the Johns Hopkins University and the Johns Hopkins Hospital, the program seeks excellence and commitment in its students to further the prevention and management of disease through the continued exploration and development of health IT. Division resources include a highly collaborative clinical faculty committed to research at the patient, provider, and system levels. The admissions process will be highly selective and finely calibrated to complement the expertise of faculty mentors.

Areas of research:

- Consumer Informatics
- Telemedicine
- eHealth
- Computer Models for Disease Prevention & Management
- Health Information Exchange
- Interactive Patient Education & Counseling
- Health IT for Care Transition
- Human Computer Interaction
- Geriatric Health Information
- Patient Quality & Safety

Individuals wishing to prepare themselves for careers as independent researchers in health sciences informatics, with applications experience in informatics across the entire health/healthcare life cycle, should apply for admission to the doctoral program.

The proposed curriculum is founded on four high-level principles:

- Balance between theory and research, and between breadth and depth of knowledge: By providing a mix of research and practical experiences and a mix of curricular requirements.
- Student-oriented curriculum design: By creating the curriculum around student needs, background, and goals, and aiming at long-term competence using a combination of broadly-applicable methodological knowledge, and a strong emphasis on self-learning skills.
- Teaching and research excellence: By placing emphasis on student and teaching quality rather than quantity, by concentrating on targeted areas of biomedical informatics, and by close student guidance and supervision.
- Developing leadership: By modeling professional behavior locally and nationally.

The Health Sciences Informatics Doctoral Curriculum integrates knowledge and skills from:

- Foundations of biomedical informatics: Includes the lifecycle of information systems, decision support.
- Information and computer science: E.g. computer organization, computability, complexity, operating systems, networks, compilers and formal languages, data bases, software engineering, programming languages, design and analysis of algorithms, data structures.
- Research methodology: Includes research design, epidemiology, and systems evaluation; mathematics for computer science (discrete mathematics, probability theory), mathematical statistics, applied statistics, mathematics for statistics (linear algebra, sampling theory, statistical inference theory, probability).
- Implementation sciences: Methods from the social sciences (e.g., organizational behavior and management, evaluation, ethics, health policy, communication, cognitive learning sciences, psychology, and sociological knowledge and methods.) Health economics, evidence-based practice, safety, quality.
- Specific informatics domains: Clinical informatics, public health informatics.
- Practical experience: Experience in informatics research, experience with health information technology.

To achieve in-depth learning of the above knowledge and skills, we adopt a student-oriented curriculum design, whereby we identify "teaching or learning processes," that is, structured activities geared towards learning (i.e., courses/projects/assignments, seminars, examinations, defenses, theses, teaching requirements, directed study, research, service, internships). These processes were selected, adapted, or created in order to meet a set of pre-specified learning objectives that were identified by the faculty as being important for graduates to master.

Admission Requirements

Application

Applicants with the following degrees and qualifications will be considered:

- BA or BS plus a satisfactory GRE score, or
- BA or BS, and a minimum of five years professional experience in a relevant field, or
- MA, MLS, MD or other PhD, with no further requirements.

"Relevant fields" include medicine, dentistry, veterinary science, nursing, ancillary clinical sciences, public health, librarianship, biomedical basic science, bioengineering and pharmaceutical sciences, and computer and information science. An undergraduate minor or major in information or computer science is highly desirable.

The application is made available online through Johns Hopkins School of Medicine's website (https://www.hopkinsmedicine.org/som/education-programs/graduate-programs/admissions/). Please note that paper applications are no longer accepted. The supporting documents listed below must be received by the SOM admissions office by February of the following year. Applications will not be reviewed until they are complete and we have all supporting letters and documentation.

- Curriculum vitae
- Three letters of recommendation
- Official transcript of school record
- Certification of terminal degree
- You may also submit a portfolio of published research, or samples of website or system development to support your application if you wish.
- Please track submission of supporting documentation through the SLATE admissions portal.
Program Requirements

23 quarter credits (5 core courses, 8 quarter credits of Student Seminar & Grand Rounds)

60 elective quarter credits (may include optional Practicum)

6 quarter credits practicum/research rotation

36 mentored research quarter credits (12 in year 1, 24 in year 2)

Core Curriculum

ME.600.903 Introduction to Public Health and Biomedical Informatics
ME.600.902 Leading Change Through Health IT
ME.600.900 Health Information Systems: Design to Deployment
ME.600.904 HIT Standards and Systems Interoperability
ME.600.901 HSI: Knowledge Engineering and Decision Support
ME.600.810 Student Seminar and Grand Rounds
ME.600.808 Capstone

Research Ethics

The proposed curriculum is founded on four high-level principles:

• Balance between theory and research, and between breadth and depth of knowledge: By providing a mix of research and practical experiences and a mix of curricular requirements.
• Student-oriented curriculum design: By creating the curriculum around student needs, background, and goals, and aiming at long-term competence using a combination of broadly-applicable methodological knowledge, and a strong emphasis on self-learning skills.
• Teaching and research excellence: By placing emphasis on student and teaching quality rather than quantity, by concentrating on targeted areas of biomedical informatics, and by close student guidance and supervision.
• Developing leadership: By modeling professional behavior locally and nationally.

The Health Sciences Informatics Doctoral Curriculum integrates knowledge and skills from:

• Foundations of biomedical informatics: Includes the lifecycle of information systems, decision support.
• Information and computer science: E.g. computer organization, computability, complexity, operating systems, networks, compilers and formal languages, data bases, software engineering, programming languages, design and analysis of algorithms, data structures.
• Research methodology: Includes research design, epidemiology, and systems evaluation; mathematics for computer science (discrete mathematics, probability theory), mathematical statistics, applied statistics, mathematics for statistics (linear algebra, sampling theory, statistical inference theory, probability).
• Implementation sciences: Methods from the social sciences (e.g., organizational behavior and management, evaluation, ethics, health policy, communication, cognitive learning sciences, psychology, and sociological knowledge and methods.) Health economics, evidence-based practice, safety, quality.
• Specific informatics domains: Clinical informatics, public health informatics.
• Practical experience: Experience in informatics research, experience with health information technology.

To achieve in-depth learning of the above knowledge and skills, we adopt a student-oriented curriculum design, whereby we identify “teaching or learning processes,” that is, structured activities geared towards learning (i.e., courses/projects/assignments, seminars, examinations, defenses, theses, teaching requirements, directed study, research, service, internships). These processes were selected, adapted, or created in order to meet a set of pre-specified learning objectives that were identified by the faculty as being important for graduates to master.