Informatics

Chair

- Gregory R. Carmichael (Chemical and Biochemical Engineering)

Graduate degrees: M.S. in informatics; Ph.D. in informatics

Graduate certificate: informatics

Faculty: http://informatics.grad.uiowa.edu/people

Web site: http://informatics.grad.uiowa.edu

The field of informatics springs from the intersection of computational disciplines related to the humanities, the arts, and the biological, health, natural, and social sciences. As the rapid development of information technology transforms the world of human pursuits, informatics offers ways to solve new problems and to examine existing problems from new perspectives.

The Informatics Program provides graduate students the opportunity to study informatics in the broadest sense. The program is interdisciplinary, involving the Graduate College, the Carver College of Medicine, the Tippie College of Business, and the Colleges of Dentistry, Engineering, Liberal Arts and Sciences, Nursing, Pharmacy, and Public Health.

Graduate Programs of Study

- Master of Science in informatics
- Doctor of Philosophy in informatics
- Certificate in Informatics

The Master of Science and Doctor of Philosophy degrees in informatics, and the Certificate in Informatics, are offered in four subprograms: bioinformatics and computational biology, geoinformatics, health informatics, and information science.

Bioinformatics and computational biology are on the cutting edge intersecting basic life and biomedical science with high-performance computing and networking, mathematics, statistics, and engineering. They are strongly influenced and directed by the ongoing development of high-throughput data collection assays such as DNA sequencing, gene expression and proteomics.

Geoinformatics provides methods and technologies needed to measure, store, analyze, manage, and visualize information about phenomena occurring on or near the earth's surface. It is an increasingly essential technology for understanding and managing the complex world.

Health informatics uses contemporary information technologies to improve the storage, organization, retrieval, and evaluation of health information in order to support clinical, clinical research, and public health applications.

Information science addresses the broad spectrum of data, information, and knowledge in seeking to identify and address recurring themes of representation, manipulation, retrieval, and comprehension. It draws from a diverse range of disciplines.

Master of Science

The Master of Science program in informatics requires a minimum of 30-32 s.h. of graduate credit, depending on the student's choice of subprogram: the bioinformatics and computational biology subprogram requires a minimum of 30 s.h. of credit; the geoinformatics, health informatics, and information science subprograms require a minimum of 32 s.h. of credit. Students working toward a Doctor of Philosophy in informatics may be granted a Master of Science upon completion of the M.S. requirements.

Credit required for the M.S. includes 9-12 s.h. in foundations of informatics and at least 9 s.h. in disciplinary applications of informatics.

Students select an advisor from their subprogram's affiliated faculty members. In consultation with their advisors, students prepare a study plan, which is reviewed at least once a year. A final master's degree examination, either oral or written, is required.

For more information about the Master of Science requirements, see Academic Programs on the Informatics Program web site.

Doctor of Philosophy

The Doctor of Philosophy program in informatics requires a minimum of 72 s.h. of graduate credit. It is offered in four subprograms: bioinformatics and computational biology, geoinformatics, health informatics, and information science.

The 72 s.h. required for the Ph.D. includes 9-12 s.h. in foundations of informatics and at least 9 s.h. in disciplinary applications of informatics. Other course requirements are outlined in the curriculum specific to each subprogram.

Students select an advisor from their subprogram's affiliated faculty members. In consultation with their advisors, students prepare a study plan, which is reviewed by their mentors and curricular advisory committees at least once a year. Ph.D. students must pass a comprehensive examination at or near completion of their course work requirements. The exam may be written, oral, or both, depending on the structure of the student's subprogram or the decision of the student's committee.

A student who does not already hold an M.S. in informatics from the University of Iowa and who has passed the Ph.D. comprehensive examination may be granted an M.S. degree in informatics without taking the final master's degree exam, upon recommendation by the informatics program.

Upon successful completion of all requirements, including the dissertation and its oral defense, students are awarded a Doctor of Philosophy.

For more information about the Doctor of Philosophy requirements, see Academic Programs on the Informatics Program web site.

Certificate

The Certificate in Informatics requires a minimum of 18-21 s.h. of graduate credit, depending on the student's choice of subprogram: the subprograms in bioinformatics and computational biology, health informatics, and information science require a minimum of 18 s.h.; the geoinformatics subprogram requires a minimum of 21 s.h. The certificate program is designed for students enrolled in University of Iowa graduate degree programs who wish to study informatics as a complement to their degree program and...
for nondegree students who are interested in increasing their knowledge of informatics.

All subprograms require a minimum of 9-12 s.h. in the foundations of informatics. In addition, the subprograms in bioinformatics and computational biology, health informatics, and information science require at least 9 s.h. in disciplinary applications of informatics; and the geoinformatics subprogram requires at least 12 s.h. in disciplinary applications of informatics.

For more information about certificate requirements, see Academic Programs on the Informatics Program web site.

**Admission**

Applicants to the M.S., Ph.D., or certificate program should apply to the degree subprogram of their choice; the subprograms make independent admission decisions. Certificate program applicants may be degree or nondegree graduate students. Applicants who are enrolled in a University of Iowa graduate degree program must be in good academic standing in their program.

Applicants must meet the admission requirements of the Graduate College; see the Manual of Rules and Regulations of the Graduate College. They also must meet the admission requirements of the informatics subprogram they want to enter; see Prospective Students/Admission Information on the program’s web site.

**Courses**

**IGPI:3110 Introduction to Informatics**  
3 s.h.
Fundamentals of computer science: algorithms, complexity, relational databases, systems concepts, programming in Python. Requirements: CS:1110 or graduate standing. Same as CS:3110.

**IGPI:5010 Research for Master's Thesis**  
arr.
Requirements: admission to M.S. program.

**IGPI:5015 Independent Study**  
arr.

**IGPI:5200 Health Informatics I**  
3 s.h.
Technological tools that support health care administration, management, and decision making. Requirements: graduate standing. Same as MED:5300, SLIS:5900, RSNM:3195, HMP:5370, IE:5860.

**IGPI:5210 Health Informatics II**  
3 s.h.
Selected health informatics initiatives, including computer-based patient records, physiologic monitoring, networking, imaging, virtual reality; participation in an interdisciplinary project team focused on an informatics innovation; application and research seminars. Same as BME:5252, RSNM:5301, IE:5870.

**IGPI:5220 Principles of Public Health Informatics**  
3 s.h.
Systematic applications of information science, computer science, and technology to public health practice, research, and learning; methods of disease surveillance, data collection, analysis, and reporting with health informatics. Offered fall semesters. Same as EPID:5200.

**IGPI:6515 Independent Study**  
arr.

**IGPI:6520 Research for Dissertation**  
arr.
Requirements: Ph.D. candidacy.