Informatics, MS

The MS in informatics is a non-research, course-based program for students who wish to enhance their careers with advanced knowledge of informatics. The coursework combines core informatics courses with cognate courses in one of these areas: geoinformatics, health informatics, or human-computer interaction.

Learning Outcomes

Students will exhibit:

- understanding of computational thinking concepts,
- experience in software development,
- expertise in data analytics methods,
- comprehension of and practice applying human-centered computing concepts,
- awareness of professional ethics, and
- domain-specific knowledge and skills related to the cognate area.

Requirements

The Master of Science program in informatics requires a total of 31 s.h. of graduate credit, including 19 s.h. of core courses and 12 s.h. of coursework in a chosen subprogram: geoinformatics, health informatics, or human-computer interaction. Students must maintain a Graduate College Program grade-point average of at least 3.00.

The non-research, course-based program is for students who wish to enhance their careers with advanced knowledge of informatics. Students must also complete the requirements for the degree as described in the Manual of Rules and Regulations, Section X, on the Graduate College website.

The MS with a major in informatics requires the following coursework.

Core Courses

All students complete the following core courses.

**Programming**

<table>
<thead>
<tr>
<th>Course #</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS:5110/IGPI:5110</td>
<td>Introduction to Informatics</td>
<td>3</td>
</tr>
<tr>
<td>One of these:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CS:3210</td>
<td>Programming Languages and Tools</td>
<td>3</td>
</tr>
<tr>
<td>CS:3980</td>
<td>Topics in Computer Science I</td>
<td>3</td>
</tr>
<tr>
<td>GEOG:5055/IGPI:5055</td>
<td>Geospatial Programming (required for geoinformatics cognate)</td>
<td>3</td>
</tr>
</tbody>
</table>

**Statistics**

<table>
<thead>
<tr>
<th>Course #</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>One of these:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIOS:4120</td>
<td>Introduction to Biostatistics (required for health informatics cognate)</td>
<td>3</td>
</tr>
<tr>
<td>STAT:4143/PSQF:4143</td>
<td>Introduction to Statistical Methods</td>
<td>3</td>
</tr>
</tbody>
</table>

**Data Science**

<table>
<thead>
<tr>
<th>Course #</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>One of these:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BAIS:6480/IGPI:6480</td>
<td>Knowledge Discovery</td>
<td>3</td>
</tr>
<tr>
<td>STAT:4540/BAIS:4540/ DATA:4540/IGPI:4540</td>
<td>Statistical Learning</td>
<td>3</td>
</tr>
<tr>
<td>An approved course (consult advisor)</td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

**Databases**

<table>
<thead>
<tr>
<th>Course #</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>One of these:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CS:4400</td>
<td>Database Systems</td>
<td>3</td>
</tr>
<tr>
<td>GEOG:4580/IGPI:4581</td>
<td>Introduction to Geographic Databases (required for geoinformatics cognate)</td>
<td>3</td>
</tr>
</tbody>
</table>

**Human Factors**

<table>
<thead>
<tr>
<th>Course #</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>One of these:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CS:4500</td>
<td>Research Methods in Human-Computer Interaction</td>
<td>3</td>
</tr>
<tr>
<td>CS:4510</td>
<td>Human-Computer Interaction for Computer Science</td>
<td>3</td>
</tr>
<tr>
<td>GEOG:5540/IGPI:5540</td>
<td>Geographic Visualization (required for geoinformatics cognate)</td>
<td>3</td>
</tr>
</tbody>
</table>

**Ethics**

<table>
<thead>
<tr>
<th>Course #</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>This course:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CS:5980</td>
<td>Topics in Computer Science III</td>
<td>1</td>
</tr>
</tbody>
</table>

Subprograms

Students choose one of three subprograms and complete the requirements.

**Geoinformatics Subprogram**

<table>
<thead>
<tr>
<th>Course #</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>All of these:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GEOG:3500/IGPI:3500</td>
<td>Introduction to Environmental Remote Sensing</td>
<td>3</td>
</tr>
<tr>
<td>GEOG:3520/IGPI:3520</td>
<td>GIS for Environmental Studies</td>
<td>3</td>
</tr>
<tr>
<td>GEOG:3570</td>
<td>Light Detection and Ranging (LiDAR): Principles and Applications</td>
<td>3</td>
</tr>
</tbody>
</table>
Health Informatics Subprogram

Course # | Title                                                                 | Hours |
---|---|---|
Four of these: |
BIOL:4386 | Introduction to Scientific Computing for Biologists | 3 |
BIOS:5120/IGPI:5120/STAT:5610 | Regression Modeling and ANOVA in the Health Sciences | 3 |
BMB:3310/CBIO:3310/MMED:3310 | Practical Data Science and Bioinformatics (recommended for students with a biology background) | 3 |
BME:5335 | Computational Bioinformatics | 3 |
CS:4470 | Health Data Analytics | 3 |
IGPI:5220/EPID:5200 | Principles of Public Health Informatics | 3 |

Human-Computer Interaction Subprogram

Course # | Title                                                                 | Hours |
---|---|---|
Three of these: |
PSQF:6243/STAT:6513 | Intermediate Statistical Methods | 3 |
PSY:3060 | Sensation and Perception | 3 |
An approved elective (consult director) | 3 |
One of these: |
CS:4500 | Research Methods in Human-Computer Interaction (if not taken to satisfy Human Factors requirement) | 3 |
CS:4510 | Human-Computer Interaction for Computer Science (if not taken to satisfy Human Factors requirement and if have not taken CS:2520) | 3 |
ISE:6211 | Human Factors in Healthcare Systems | 3 |
ISE:6220 | Cognitive Engineering | 3 |

For more information about the Master of Science requirements, see the Interdisciplinary Graduate Program in Informatics website.

Combined Programs

MS (Health Informatics Subprogram)/PharmD

The purpose of the combined program is to provide an opportunity for professional students in the College of Pharmacy to receive formal training in health informatics in addition to training in pharmaco therapy and health care. Students completing the degree program receive an MS in informatics with the health informatics subprogram (without thesis) from the Graduate College and a PharmD from the College of Pharmacy. Students develop special expertise in information technology, including management of electronic health records, health information exchange standards, electronic prescribing, medication management, decision support, and other competencies.

The combined program requires a total of 34 s.h. beyond the bachelor’s degree. Courses that can be used to count toward both programs include 19 s.h. of core courses, 6 s.h. of courses from the health informatics cognate, and 9 s.h. from the PharmD curriculum selected from the following.

<table>
<thead>
<tr>
<th>Course #</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHAR:8250</td>
<td>Applications of Pharmacy Practice I</td>
<td>2</td>
</tr>
<tr>
<td>PHAR:8255</td>
<td>Discovery II: Design and Methods</td>
<td>arr.</td>
</tr>
<tr>
<td>PHAR:8265</td>
<td>Applications of Pharmacy Practice II</td>
<td>2</td>
</tr>
<tr>
<td>PHAR:8374</td>
<td>Applications of Pharmacy Practice III</td>
<td>2</td>
</tr>
<tr>
<td>PHAR:8375</td>
<td>Advanced Topics in Health Services</td>
<td>2</td>
</tr>
<tr>
<td>PHAR:8378</td>
<td>Pharmacy Law and Ethics</td>
<td>2</td>
</tr>
</tbody>
</table>

Separate application to each degree program is required. Applicants must be admitted to both programs before they may be admitted to the combined degree program. It is recommended that students apply to the Graduate College for admission to the MS program before entering the spring semester of their first year in the pharmacy program. For more information, see Doctor of Pharmacy, PharmD in the College of Pharmacy section of the catalog.

Admission

Applicants must meet the admission requirements of the Graduate College; see the Manual of Rules and Regulations on the Graduate College website. They also must meet the admission requirements of the informatics subprogram they want to enter; see PhD and MS Admission on the program's website.

Academic Plans

Sample Plans of Study

Sample plans represent one way to complete a program of study. Actual course selection and sequence will vary and should be discussed with an academic advisor. For additional sample plans, see MyUI.

Informatics, MS

- Geoinformatics Subprogram [p. 2]
- Health Informatics Subprogram [p. 3]
- Human-Computer Interaction Subprogram [p. 3]

Geoinformatics Subprogram

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Career</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any Semester</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
31 s.h. must be graduate level coursework; graduate transfer credits allowed upon approval. More information is included in the General Catalog and on department website. a

*Hours 0
First Year

Fall
BIOS:4120 or STAT:4143 Introduction to Biostatistics or Introduction to Statistical Methods 3
CS:5110 Introduction to Informatics 3
Geoinformatics Cognate course b 3

Hours 9

Spring
BAIS:6480 Knowledge Discovery 3
or STAT:4540 or Statistical Learning 3
CS:5980 Topics in Computer Science III c 1
GEOG:4580 Introduction to Geographic Databases 3
GEOG:5055 Geospatial Programming 3

Hours 10

Second Year

Fall
GEOG:5540 Geographic Visualization 3
Geoinformatics Cognate course b 3
Geoinformatics Cognate course b 3

Hours 9

Spring
Geoinformatics Cognate course b 3
Verify completion of all degree requirements

Hours 3

Total Hours 31

a Students must complete specific requirements in the University of Iowa Graduate College after program admission. Refer to the Graduate College website and the Manual of Rules and Regulations for more information.
b Typically this course is offered in spring semesters only. Check MyUI for course availability since offerings are subject to change.
c See the General Catalog for list of approved courses.

Health Informatics Subprogram

Course Title Hours
Academic Career
Any Semester
31 s.h. must be graduate level coursework; graduate transfer credits allowed upon approval. More information is included in the General Catalog and on department website. a

Hours 0

First Year

Fall
BIOS:4120 or STAT:4143 Introduction to Biostatistics or Introduction to Statistical Methods 3
CS:4400 or GEOG:4580 Database Systems or Introduction to Geographic Databases 3
CS:5110 Introduction to Informatics 3

Hours 9

Spring
STAT:4540 or BAIS:6480 Statistical Learning or Knowledge Discovery 3
CS:3210 or CS:3980 or GEOG:5055 Programming Languages and Tools or Topics in Computer Science I or Geospatial Programming 3

Hours 9

a Students must complete specific requirements in the University of Iowa Graduate College after program admission. Refer to the Graduate College website and the Manual of Rules and Regulations for more information.
b Typically this course is offered in spring semesters only. Check MyUI for course availability since offerings are subject to change.
c See the General Catalog for list of approved courses.

Human-Computer Interaction Subprogram

Course Title Hours
Academic Career
Any Semester
31 s.h. must be graduate level coursework; graduate transfer credits allowed upon approval. More information is included in the General Catalog and on department website. a

Hours 0

First Year

Fall
CS:5110 Introduction to Informatics 3
GEOG:4580 or CS:4400 Introduction to Geographic Databases or Database Systems 3
BIOS:4120 or STAT:4143 Introduction to Biostatistics or Introduction to Statistical Methods 3

Hours 9

Spring
STAT:4540 or BAIS:6480 Statistical Learning or Knowledge Discovery 3
CS:3210 or CS:3980 or GEOG:5055 Programming Languages and Tools or Topics in Computer Science I or Geospatial Programming 3

Hours 9

a Students must complete specific requirements in the University of Iowa Graduate College after program admission. Refer to the Graduate College website and the Manual of Rules and Regulations for more information.
b Typically this course is offered in spring semesters only. Check MyUI for course availability since offerings are subject to change.
c See the General Catalog for list of approved courses.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOG:5540</td>
<td>Geographic Visualization or Research Methods in Human-Computer Interaction or Human-Computer Interaction for Computer Science</td>
<td>3</td>
</tr>
<tr>
<td>or CS:4500</td>
<td>or Human-Computer Interaction for Computer Science</td>
<td></td>
</tr>
<tr>
<td>or CS:4510</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CS:5980</td>
<td>Topics in Computer Science III b</td>
<td>1</td>
</tr>
</tbody>
</table>

**Hours: 10**

**Second Year**

**Fall**

- Human-Computer Interaction Cognate course c 3
- Human-Computer Interaction Cognate course c 3
- Human-Computer Interaction Cognate course c 3

**Hours: 9**

**Spring**

- Human-Computer Interaction Cognate course c 3
- Verify completion of all degree requirements

**Hours: 3**

**Total Hours: 31**

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*a Students must complete specific requirements in the University of Iowa Graduate College after program admission. Refer to the Graduate College website and the Manual of Rules and Regulations for more information.

*b Typically this course is offered in spring semesters only. Check MyUI for course availability since offerings are subject to change.

*c See the General Catalog for list of approved courses.*