Informatics, Ph.D.

The Ph.D. in informatics emphasizes preparation for research, teaching, and scholarly endeavor in academic settings or private, industrial, or governmental laboratories. Students focus on applying informatics research to a field of choice (e.g., health, biology, human-computer interaction, geography, design).

Learning Outcomes

Students will exhibit:

- broad, up-to-date knowledge of informatics topics including computational thinking, software development, data analytics, human-centered computing concepts, and professional ethics;
- domain-specific knowledge and skills related to the field of application of informatics research;
- fluency at reading, analyzing, synthesizing, and communicating research; and a
- thorough understanding of relevant research methods and ability to conduct original research that contributes to the field of informatics.

Requirements

The Doctor of Philosophy program in informatics requires at least 72 s.h. of graduate credit. A total of 19 s.h. of core courses are required plus an additional 12 s.h. of courses approved by a student's committee. The remaining 41 s.h. may be completed with additional coursework or through reading or research hours. Students must maintain a program g.p.a. of at least 3.00.

It requires completion of coursework, satisfactory performance on the qualifying exam, comprehensive exam, and the proposal, plus the production and formal defense of a dissertation describing original research results.

Students select an advisor from among the program faculty. On the rare occasion when students choose a Ph.D. advisor who is outside the program, a co-advisor from the program faculty must be designated.

The Ph.D. with a major in informatics requires the following coursework.

Core Courses

Students complete a total of 19 s.h. in core coursework. The student's advisor and the rest of the student's committee consisting of at least two other faculty select remaining courses (12 s.h. minimum) for a total of at least 31 s.h. of coursework.

Programming

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>This course:</td>
<td></td>
<td></td>
</tr>
<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</td>
<td>3</td>
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Statistics

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<tr>
<th>Code</th>
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<th>Hours</th>
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<tbody>
<tr>
<td>One of these:</td>
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<tr>
<td>BIOS:4120</td>
<td>Introduction to Biostatistics</td>
<td>3</td>
</tr>
<tr>
<td>STAT:4143/PSQF:4143</td>
<td>Introduction to Statistical Methods</td>
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Data Science

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<tr>
<th>Code</th>
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<th>Hours</th>
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<tbody>
<tr>
<td>One of these:</td>
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<tr>
<td>BAIS:6480</td>
<td>Knowledge Discovery</td>
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<tr>
<td>STAT:4540/BAIS:4540/IGPI:4540</td>
<td>Statistical Learning</td>
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<tr>
<td>An additional course (consult advisor)</td>
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Databases

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>One of these:</td>
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<td></td>
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<tr>
<td>CS:4400</td>
<td>Database Systems</td>
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<tr>
<td>GEOG:4580/IGPI:4581</td>
<td>Introduction to Geographic Databases</td>
<td>3</td>
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Human Factors

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<tr>
<th>Code</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</td>
<td>3</td>
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</table>

Ethics

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<tr>
<th>Code</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>
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Elective Core Coursework

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coursework selected in consultation with advisor and committee</td>
<td></td>
<td>12</td>
</tr>
</tbody>
</table>

Electives

The remaining 41 s.h. may be completed with additional coursework or through reading or research hours.

Comprehensive Examination

Ph.D. students must pass a comprehensive examination at or near completion of their coursework requirements. Students prepare a 20-30 page survey/discussion (along the lines of the introduction and literature review from an eventual thesis) for distribution to their faculty committee, followed at least two weeks later by a 20-40 minute oral presentation, and a question/answer session.

Students may request that the M.S. degree be granted at the time of the comprehensive exam. The M.S. degree
without thesis is awarded upon successful completion of the comprehensive exam but may, at the examination committee's discretion, be awarded even if students do not pass the exam. Students also may choose to complete the thesis requirements and be awarded an M.S. with thesis degree.

**Dissertation**

Students complete dissertation coursework in consultation with their advisor.

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

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

**Combined Programs**

**Ph.D./M.D.**

Students may work toward the Doctor of Medicine degree and a Ph.D. in informatics in a combined degree program offered by the Carver College of Medicine and the Graduate College. Applicants must be admitted to both programs before they may be admitted to the combined degree program. See the Medical Scientist Training Program (Carver College of Medicine) in the Catalog.

**Admission**

Students applying to the Ph.D. program do not need a master's degree prior to admission. Students who hold a master's degree upon entering the Ph.D. program may apply to use transfer credit from their master's degree courses toward their Ph.D. program requirements.

Students applying to the Ph.D. program who are not selected for admission are automatically considered for admission to the M.S. program if they do not already hold a master's degree.

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 program; see Ph.D. and M.S. Admission on the program’s website.

**Career Advancement**

The program emphasizes preparation for research, teaching, and scholarly endeavor in academic settings or private, industrial, or governmental laboratories.

**Academic Plans**

**Sample Plan 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, Ph.D.**

**Course** | **Title** | **Hours**
--- | --- | ---
**Academic Career** |  |  
**Any Semester** |  |  
**First Year** |  |  
**Fall** |  |  
CS:5110 | Introduction to Informatics | 3  
STAT:4143 or BIOS:4120 | Introduction to Statistical Methods or Introduction to Biostatistics | 3  
Elective course |  | 3  
**Hours** |  | 9  
**Spring** |  |  
BAIS:6480 or STAT:4540 | Knowledge Discovery or Statistical Learning | 3  
GEOG:4580 or CS:4400 | Introduction to Geographic Databases or Database Systems | 3  
GEOG:5055 or CS:3210 or CS:3980 | Geospatial Programming or Programming Languages and Tools or Topics in Computer Science I | 3  
CS:5980 | Topics in Computer Science III | 1  
**Hours** |  | 10  
**Second Year** |  |  
**Any Semester** |  |  
Qualifying Exam |  | 0  
**Fall** |  |  
GEOG:5540 or CS:4500 or CS:4510 | Geographic Visualization or Research Methods in Human-Computer Interaction or Human-Computer Interaction for Computer Science | 3  
Elective course |  | 3  
Elective course |  | 3  
**Hours** |  | 9  
**Spring** |  |  
Elective course |  | 3  
Elective course |  | 3  
Elective course |  | 3  
**Hours** |  | 9  
**Third Year** |  |  
**Any Semester** |  |  
Comprehensive Exam |  | 0  
**Fall** |  |  
Elective course |  | 3  
Elective course |  | 3  
Elective course |  | 3  
**Hours** |  | 9  
**Spring** |  |  
Elective course |  | 3
Elective course 3
Elective course 3

**Fourth Year**

**Fall**
Dissertation Proposal Defense 3
Elective course 3
Elective course 3
Elective course 3

**Hours** 9

**Spring**
IGPI:6520 Research for Dissertation 8
Final Oral Exam

**Hours** 8

**Total Hours** 72

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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 See the General Catalog and department website for specifics about elective coursework requirements; may be a combination of research for dissertation hours, directed readings, independent study, and graduate coursework.
c Typically this course is offered in spring semesters only. Check MyUI for course availability since offerings are subject to change.
d Typically completed during second year fall semester. See the General Catalog and department website for specifics.
e Taken before the end of third year. See the General Catalog and department website for specifics.
f Typically completed six months prior to final oral exam (dissertation defense).
g Dissertation defense.