Informatics, B.S.

The major in informatics provides students with the necessary training for employment in careers such as software development and information management. It provides good preparation for graduate study in a variety of disciplines.

The department encourages students majoring in informatics to consider earning a second major, certificate, or minor. Students may declare a major in informatics when they are admitted to the University or afterward. All students begin the majors as Bachelor of Arts students but may switch to the Bachelor of Science program at any time.

The informatics major combines fundamental and practical computing knowledge with a choice of cognate areas from the liberal arts and sciences, providing students with the necessary background and specialized skills to work at the interface of computing and another discipline. Students may begin the major without a chosen cognate area; they may declare a cognate at any time. Some cognates are available only with the Bachelor of Arts, others are available only with the Bachelor of Science. So a student's choice of cognate determines whether the student will earn a B.A. or a B.S.

Both computer science and informatics majors are advised at the Academic Advising Center until they have completed 24 s.h., at which point they are assigned a departmental advisor. Students being advised at the Academic Advising Center also can consult with an informatics faculty advisor.

Transfer students who have taken a course approved as equivalent to a required informatics or computer science course are exempt from that course. Transfer course grades are included in the informatics grade-point average.

Students should consult the Department of Computer Science website or visit the department's office for information about general policies, elective areas, and internships, scholarships, and student groups, such as the University's chapter of the Association for Computing Machinery (ACM) and Women in Informatics and Computer Science (WICS).

Advanced Placement

The Computer Science Advanced Placement Program test may be used to satisfy requirements. See "Advanced Placement" under Undergraduate Programs on the Department of Computer Science website.

### Requirements

The Bachelor of Science with a major in informatics requires a minimum of 120 s.h., including at least 55-60 s.h. of work for the major. Students must maintain a g.p.a. of at least 2.00 in all courses for the major and in all UI courses for the major. They also must complete the College of Liberal Arts and Sciences General Education Program. A cumulative g.p.a. of at least 2.00 is required for graduation.

Required credit for the major depends on the choice of cognate area. Work for the major may not be taken pass/nonpass.

The program combines foundational informatics course work with course work in a cognate discipline. The major in informatics offers the cognate areas of bioinformatics, medical informatics, and individualized cognates.

Course work for the major includes the informatics core, two electives, a statistics course, and a set of courses in the chosen cognate area. Students are expected to have taken MATH:1005 College Algebra or the equivalent.

Students must complete at least five courses (minimum of 15 s.h.) at the University of Iowa from the following: CS:3910 Informatics Project and four additional courses numbered CS:2500-CS:4990 or MSC:4220 Advanced Database Management and Big Data.

The B.S. with a major in informatics requires the following course work.

<table>
<thead>
<tr>
<th>Informatics Core Courses</th>
<th>19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Informatics Electives</td>
<td>6</td>
</tr>
<tr>
<td>Statistics Course</td>
<td>3-4</td>
</tr>
<tr>
<td>Cognate Courses</td>
<td>27-31</td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td>55-60</td>
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</tbody>
</table>

### Informatics Core

The informatics core consists of six required computing courses (at least 19 s.h.) that emphasize data manipulation, databases, and networking. It provides more applications-oriented content than the traditional computer science curriculum yet is designed to offer students a sound basis in underlying computer science themes and techniques.

<table>
<thead>
<tr>
<th>This course:</th>
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<tbody>
<tr>
<td>CS:2110 Programming for Informatics</td>
<td>4</td>
</tr>
<tr>
<td>One of these:</td>
<td></td>
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<tr>
<td>CS:2420 Databases for Informatics</td>
<td>3</td>
</tr>
<tr>
<td>MSC:3200 Database Management</td>
<td>3</td>
</tr>
<tr>
<td>All of these:</td>
<td></td>
</tr>
<tr>
<td>CS:1110 Introduction to Computer Science</td>
<td>3</td>
</tr>
<tr>
<td>CS:2520 Human-Computer Interaction</td>
<td>3</td>
</tr>
<tr>
<td>CS:2620 Networking and Security for Informatics</td>
<td>3</td>
</tr>
<tr>
<td>CS:3910 Informatics Project</td>
<td>3</td>
</tr>
</tbody>
</table>

### Informatics Electives

Students must complete at least two courses (6 s.h.) from a list of approved computing informatics electives. Course selection must be approved by an informatics advisor. In addition to the courses listed below, students may have additional choices from the Department of Electrical and Computer Engineering and the Department of Management Sciences; consult an informatics faculty advisor for additional choices.

<table>
<thead>
<tr>
<th>MSCI:4220 Advanced Database Management and Big Data</th>
<th>3</th>
</tr>
</thead>
</table>

A computer science course (prefix CS) numbered 3000-4990, except CS:3910

### Statistics Course

Students must complete one introductory statistics course. Some cognates require a specific statistic course. Students should consult with their advisors to choose a statistics course appropriate for their cognate area.

One of these:
Cognates

Students must complete all requirements listed under one of the cognate areas below: bioinformatics, medical informatics, or an individualized cognate.

Bioinformatics

The informatics major with the bioinformatics cognate requires a minimum of 58 s.h. of work for the major, including at least 30 s.h. in cognate courses. The bioinformatics cognate is intended for students interested in applications of computing to the biological sciences. It may lead to careers in laboratory research, biotechnology, data management, and other related areas. It also may prepare students for graduate programs in bioinformatics or genetics. Cognate courses are drawn primarily from biology and chemistry.

Students who choose the bioinformatics cognate must satisfy the major’s statistics requirement with either STAT:2010 Statistical Methods and Computing or STAT:3510 Biostatistics.

Bioinformatics

SOC:2160 Applied Statistics for Social Scientists 3
STAT:1020 Elementary Statistics and Inference 3
STAT:1030 Statistics for Business 4
STAT:2010 Statistical Methods and Computing 3
STAT:2020 Probability and Statistics for the Engineering and Physical Sciences 3
STAT:3120 Probability and Statistics 4
STAT:3510 Biostatistics 3
STAT:4143 Introduction to Statistical Methods 3

All of these:
BIOL:1411 Diversity of Form and Function 4
BIOL:1412 Foundations of Biology 4
CHEM:1110 Principles of Chemistry I 4
CHEM:1120 Principles of Chemistry II 4
BIOL:2512 Fundamental Genetics 4
BIOL:3172 Evolution 4

Two of these:
BIOL:2673 Ecology 3-4
BIOL:3314 Genomics 3
BIOL:4213 Bioinformatics 4
BIOL:5320 Computational Genomics 3

Medical Informatics

The informatics major with the medical informatics cognate requires a minimum of 56 s.h. of work for the major, including at least 28 s.h. in cognate courses. The medical informatics cognate is intended for students interested in applications of computing to health care, especially in a clinical setting. It may lead to careers in medical or hospital settings, graduate programs in medical informatics, or professional degree programs in medicine, dentistry, nursing, or other allied health professions. Cognate courses are drawn from biology, chemistry, health and human physiology, and public health.

Students who choose the medical informatics cognate must satisfy the major’s statistics requirement with either STAT:2010 Statistical Methods and Computing or STAT:3510 Biostatistics.

Medical Informatics

SOC:2160 Applied Statistics for Social Scientists 3
STAT:1020 Elementary Statistics and Inference 3
STAT:1030 Statistics for Business 4
STAT:2010 Statistical Methods and Computing 3
STAT:2020 Probability and Statistics for the Engineering and Physical Sciences 3
STAT:3120 Probability and Statistics 4
STAT:3510 Biostatistics 3
STAT:4143 Introduction to Statistical Methods 3

All of these:
BIOL:1411 Diversity of Form and Function 4
BIOL:1412 Foundations of Biology 4
CHEM:1110 Principles of Chemistry I 4
CHEM:1120 Principles of Chemistry II 4
CHEM:2210 & CHEM:2220 Organic Chemistry I-II 6

At least two of these, to complete 28 s.h. for the medical informatics cognate:

All of these:
BIOL:2512 Fundamental Genetics 4
BIOL:3172 Evolution 4
CHEM:2410 Organic Chemistry Laboratory 3
HHP:1100 Human Anatomy 3
HMP:4000 Introduction to the U.S. Health Care System 3

Individualized Cognates

Individualized cognates may be drawn primarily from one department or an appropriate mix of departments; they require an approved set of cognate courses totaling 27-31 s.h. Students interested in developing individualized cognates should contact the Department of Computer Science for the name of an informatics faculty advisor.

Early Admission to the Graduate College

Undergraduate informatics students who have 6 s.h. or less to earn toward graduation may apply for early admission to the Graduate College. Early admission allows students in their final undergraduate semester to take courses for graduate credit in addition to the courses they need to complete their bachelor’s degrees.

Honors

Honors in the Major

Students majoring in informatics have the opportunity to graduate with honors in the major. They must maintain a minimum UI cumulative g.p.a. of 3.33 and complete 4-6 s.h. of CS:3990 Honors in Computer Science or Informatics which requires the submission of an acceptable honors thesis. Students are responsible for finding a faculty member willing to supervise their honors project. They can register for CS:3990 with the project supervisor’s name once the faculty member approves the proposed project and a timetable for the work. For more details, see Honors on the Department of Computer Science website.

University of Iowa Honors Program

In addition to honors in the major, students have opportunities for honors study and activities through membership in the University of Iowa Honors Program. Visit Honors at Iowa to learn about the University’s honors program.

Membership in the UI Honors Program is not required to earn honors in the informatics major. However, the semester hours earned in CS:3990 Honors in Computer Science or Informatics
can be used to partially satisfy the UI Honors requirement of 12 s.h. of experiential learning course work.

**Academic Plans**

**Four-Year Graduation Plan**

The Four-Year Graduation Plan is not available to students majoring in informatics. Students work with their advisors on individual graduation plans.

**Career Advancement**

Informatics graduates work in a broad range of market sectors, reflecting the interdisciplinary nature of the program and the large number of available cognates. Some graduates pursue software development opportunities or careers as database and/or web administrators; others enter the IT job market as software support personnel or in a managerial role. Other graduates pursue careers in their cognate field, where their computing skills are at a premium.

A recent job placement survey indicates that more than 90 percent of University of Iowa informatics graduates were placed or no longer seeking employment within six months of graduation.

The Pomerantz Career Center offers multiple resources to help students find internships and jobs.