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.

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. A student’s choice of cognate determines whether the student will earn a B.A. or a B.S.

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 Computing Sciences (WiCS).

Advanced Placement

The Computer Science Advanced Placement Program test may be used to satisfy requirements. See Advanced Placement Credit Policy on the Department of Computer Science website.

Learning Outcomes

- Students have a basic grounding in computer science.
- Students have a thorough understanding of information processing tools and constructs.
- Students have a user-centric perspective on computing tools.
- Students have a thorough understanding of chosen cognate area.
- Students can apply computing tools to problem solving.

The program combines foundational informatics coursework with coursework in a cognate area. The major offers the cognate areas of bioinformatics, medical informatics, and individualized cognates. Required credit for the major depends on a student’s choice of cognate area.

Coursework for the major includes the informatics core, two electives, a statistics course, and a set of courses in the chosen cognate area. Work for the major may not be taken pass/nonpass. Students are expected to have taken MATH:1005 College Algebra or the equivalent.

Departmental Residency Requirement

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:4999; these courses are requirements for the B.S. in informatics as listed below.

Program Requirements

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

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS:1110</td>
<td>Introduction to Computer Science</td>
<td>3</td>
</tr>
<tr>
<td>CS:2110</td>
<td>Programming for Informatics</td>
<td>4</td>
</tr>
<tr>
<td>CS:2420</td>
<td>Databases for Informatics</td>
<td>3</td>
</tr>
<tr>
<td>CS:2520</td>
<td>Human-Computer Interaction</td>
<td>3</td>
</tr>
<tr>
<td>CS:2620</td>
<td>Networking and Security for Informatics</td>
<td>3</td>
</tr>
<tr>
<td>CS:3910</td>
<td>Informatics Project</td>
<td>3</td>
</tr>
</tbody>
</table>

Informatics Core

The informatics core consists of six required computing courses (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>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAIS:4220</td>
<td>Advanced Database Management and Big Data</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 Business Analytics; consult an informatics faculty advisor for additional choices.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
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<td></td>
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</tbody>
</table>
A computer science course (prefix CS) numbered 3000-4999, including CS:3990 for 3 s.h., but excluding CS:3910

Statistics Course

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

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOC:2160</td>
<td>Applied Statistics for Social Scientists</td>
<td>3</td>
</tr>
<tr>
<td>STAT:1020</td>
<td>Elementary Statistics and Inference</td>
<td>3</td>
</tr>
<tr>
<td>STAT:1030</td>
<td>Statistics for Business</td>
<td>4</td>
</tr>
<tr>
<td>STAT:2010</td>
<td>Statistical Methods and Computing</td>
<td>3</td>
</tr>
<tr>
<td>STAT:2020</td>
<td>Probability and Statistics for the Engineering and Physical Sciences</td>
<td>3</td>
</tr>
<tr>
<td>STAT:3120</td>
<td>Probability and Statistics</td>
<td>4</td>
</tr>
<tr>
<td>STAT:3510</td>
<td>Biostatistics</td>
<td>3</td>
</tr>
<tr>
<td>STAT:4143</td>
<td>Introduction to Statistical Methods</td>
<td>3</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL:1411</td>
<td>Foundations of Biology</td>
<td>4</td>
</tr>
<tr>
<td>BIOL:1412</td>
<td>Diversity of Form and Function</td>
<td>4</td>
</tr>
<tr>
<td>CHEM:1110</td>
<td>Principles of Chemistry I</td>
<td>4</td>
</tr>
<tr>
<td>CHEM:1120</td>
<td>Principles of Chemistry II</td>
<td>4</td>
</tr>
<tr>
<td>CHEM:2410</td>
<td>Organic Chemistry Laboratory</td>
<td>3</td>
</tr>
<tr>
<td>HHP:1100</td>
<td>Human Anatomy</td>
<td>3</td>
</tr>
</tbody>
</table>

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.

Combined Programs

B.S./M.S. in Business Analytics (Career Subprogram)

Students majoring in informatics who are interested in earning a master’s degree in business analytics with a career subprogram may apply to the combined B.S./M.S. program offered by the College of Liberal Arts and Sciences and the Tippie College of Business. The program enables students to begin the study of business analytics before they complete
their bachelor's degree. Students are able to complete both
degrees in five years rather than six.

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. For
information about the business analytics program, see the
M.S. in business analytics (career) in the Tippie College of
Business section of the Catalog.

B.S./M.S. in Finance

Students majoring in informatics who are interested in earning
a master's degree in finance may apply to the combined
B.S./M.S. program offered by the College of Liberal Arts
and Sciences and the Tippie College of Business. The program
enables students to begin the study of finance before they
complete their bachelor's degree. Students are able to
complete both degrees in five years rather than six.

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. For
information about the finance program, see the M.S. in finance
(Tippie College of Business) section of the Catalog.

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 a minimum major
g.p.a. of 3.50; additionally, students complete 4-6 s.h. of
CS:3990 Honors in Computer Science or Informatics and
submit an acceptable honors thesis or project. At any
time, students can communicate to the computer science
professional advisor that they have an honors interest and can
have that designation placed on their academic record.

A student is responsible for finding a faculty member willing
to supervise the honors project. The student can register for
CS:3990 Honors in Computer Science or Informatics under the
project supervisor's name once the faculty member approves
the proposal and a timetable for the work. Once
that is accomplished, the student must then communicate
with the Department of Computer Science honors director,
who changes the student's status to denote the student is
pursuing honors in the major. It is not necessary to have
declared an honors interest before finding a thesis supervisor
and beginning to pursue honors in the major, but the student
must be coded as pursuing honors prior to completing the
application for degree.

An honors project can be completed in one semester, but
it usually takes two semesters to complete. In the final
semester, a student must register for CS:3999 Computer
Science or Informatics Honors Cohort (0 s.h.). The honors
thesis/project must be approved by the thesis supervisor and
then submitted to the honors director who will give initial
approval that the student can graduate with honors in the
major. Final approval is given after final grades are submitted
and all requirements are met. For more details regarding
project requirements, see Honors on the Department of
Computer Science website.

University of Iowa Honors Program

In addition to honors in the major, students can pursue 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 coursework.

For more information, contact the Department of Computer
Science honors director.

Academic Plans

Four-Year Graduation Plan

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

• Bioinformatics Track [p. 3]
• Medical Informatics Track [p. 4]

Bioinformatics Track

Course Title Hours
First Year
Fall
RHET:1030 or ENGL:1200 Rhetoric or The Interpretation of
Literature 3 - 4
GE CLAS Core: Diversity and Inclusion a 3
CHEM:1110 Principles of Chemistry I b, c 4
CSCI:1110 Introduction to Computer Science b 3
CSCI:1600 Success at Iowa 2
Hours 15-16
Spring
ENGL:1200 or RHET:1030 The Interpretation of Literature
or Rhetoric 3
CSCI:2110 Programming for Informatics 4
CHEM:1120 Principles of Chemistry II 4
Elective course d 3
Hours 14
Second Year
Fall
GE CLAS Core: World Languages First Level Proficiency or elective course e 4 - 5
GE CLAS Core: Social Sciences a 3
CSCI:2520 Human-Computer Interaction 3
BIOL:1411 Foundations of Biology 4
Elective course\textsuperscript{d} & 2 & 16-17 & \\
\textbf{Spring} &  &  & \\
GE CLAS Core: World Languages Second Level & 4 - 5 &  & \\
Proficiency or elective course\textsuperscript{e} &  &  & \\
GE CLAS Core: International and Global Issues\textsuperscript{a} & 3 &  & \\
CS:2620 & Networking and Security for Informatics & 3 & \\
BIOL:1412 & Diversity of Form and Function & 4 & 2 & \\
Elective course\textsuperscript{d} &  & 16-17 & \\
\textbf{Third Year} &  &  & \\
\textbf{Fall} &  &  & \\
GE CLAS Core: World Languages Second Level & 4 - 5 &  & \\
Proficiency or elective courses\textsuperscript{e} &  &  & \\
CS:2420 & Databases for Informatics & 3 & \\
Major: statistics requirement & 3 &  & \\
GE CLAS Core: Historical Perspectives\textsuperscript{a} & 3 &  & \\
Elective course\textsuperscript{d} & 3 & 16-17 & \\
\textbf{Spring} &  &  & \\
GE CLAS Core: World Languages Fourth Level & 4 - 5 &  & \\
Proficiency or elective course\textsuperscript{e} &  &  & \\
GE CLAS Core: Literary, Visual, and Performing Arts\textsuperscript{a} & 3 &  & \\
Major: Informatics advanced elective\textsuperscript{f} & 3 &  & \\
BIOL:2512 & Fundamental Genetics & 4 & 2 & \\
Elective course\textsuperscript{d} &  & 16-17 & \\
\textbf{Fourth Year} &  &  & \\
\textbf{Fall} &  &  & \\
GE CLAS Core: Values and Culture\textsuperscript{a} & 3 &  & \\
Major: Informatics advanced elective\textsuperscript{f} & 3 &  & \\
BIOL:3172 & Evolution & 4 & 3 & \\
Elective course\textsuperscript{d} & 3 & 2 & \\
Elective course\textsuperscript{d} &  & 15 & \\
\textbf{Spring} &  &  & \\
CS:3910 & Informatics Project & 3 & \\
Major: advanced Biology elective\textsuperscript{g} & 3 &  & \\
Major: advanced Biology elective\textsuperscript{g} & 3 &  & \\
Elective course\textsuperscript{d} & 3 &  & \\
Elective course\textsuperscript{d} & 3 &  & \\
Degree Application: apply on MyUI before deadline (typically in February for spring, September for fall) &  & 15 & \\
\textbf{Third Year} &  &  & \\
\textbf{Fall} &  &  & \\
GE CLAS Core: World Languages Second Level & 4 - 5 &  & \\
Proficiency or elective course\textsuperscript{e} &  &  & \\
CS:2420 & Databases for Informatics & 3 & \\
Major: statistics requirement\textsuperscript{f} & 3 &  & \\
GE CLAS Core: Historical Perspectives\textsuperscript{a} & 3 &  & \\
Elective course\textsuperscript{d} & 3 & 16-17 & \\
\textbf{Medical Informatics Track} &  &  & \\
\textbf{Course} & \textbf{Title} & \textbf{Hours} & \\
\textbf{First Year} &  &  & \\
Fall &  &  & \\
ENGL:1200 & The Interpretation of Literature or Rhetoric & 3 - 4 & \\
GE CLAS Core: Diversity and Inclusion\textsuperscript{a} & 3 &  & \\
CHEM:1110 & Principles of Chemistry I\textsuperscript{b, c} & 4 & \\
CS:1110 & Introduction to Computer Science\textsuperscript{c} & 3 & \\
CS:1600 & Success at Iowa & 2 & 15-16 & \\
\textbf{Spring} &  &  & \\
ENGL:1200 & The Interpretation of Literature or Rhetoric & 3 - 4 & \\
CS:2110 & Programming for Informatics & 4 & \\
CHEM:1120 & Principles of Chemistry II\textsuperscript{c} & 4 & 3 & \\
Elective course\textsuperscript{d} &  & 14-15 & \\
\textbf{Second Year} &  &  & \\
\textbf{Fall} &  &  & \\
GE CLAS Core: World Languages First Level & 4 - 5 &  & \\
Proficiency or elective course\textsuperscript{e} &  &  & \\
GE CLAS Core: Social Sciences\textsuperscript{a} & 3 &  & \\
CS:2520 & Human-Computer Interaction & 3 & \\
BIOL:1411 & Foundations of Biology & 4 & 2 & \\
Elective course\textsuperscript{d} &  & 16-17 & \\
\textbf{Spring} &  &  & \\
GE CLAS Core: World Languages Second Level & 4 - 5 &  & \\
Proficiency or elective course\textsuperscript{e} &  &  & \\
GE CLAS Core: International and Global Issues\textsuperscript{a} & 3 &  & \\
CS:2620 & Networking and Security for Informatics & 3 & \\
BIOL:1412 & Diversity of Form and Function & 4 & 2 & \\
Elective course\textsuperscript{d} &  & 16-17 & \\
\textbf{Third Year} &  &  & \\
\textbf{Fall} &  &  & \\
GE CLAS Core: World Languages Second Level & 4 - 5 &  & \\
Proficiency or elective course\textsuperscript{e} &  &  & \\
CS:2420 & Databases for Informatics & 3 & \\
Major: statistics requirement\textsuperscript{f} & 3 &  & \\
GE CLAS Core: Historical Perspectives\textsuperscript{a} & 3 &  & \\
Elective course\textsuperscript{d} & 3 & 16-17 &
Informatics graduates work in a broad range of market sectors, reflecting the interdisciplinary nature of the program and the large number of available cognates. Students will have technical skills along with a specialty area that can help them pursue a specific type of organization or interest field. Here are just a few of the areas that informatics graduates have pursued:

- software development
- database and/or web administrators
- data analyst
- software support personnel (IT)
- user interface/user experience web designers (the human-computer interaction cognate is useful for this area)
- health care information technicians (the health informatics cognate is useful for this area)

A recent job placement survey indicates that more than 90 percent of University of Iowa informatics graduates have a job, are continuing education, or are not seeking employment within six months of graduation.

View post-graduation data on the Pomerantz Career Center website that uses University of Iowa placement information to explore what recent informatics alumni are doing that includes median salaries, job titles, companies of employment, and other facts about UI graduates.

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