Informatics, B.A.

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 major as Bachelor of Arts students but may switch to the Bachelor of Science programs 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.

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 Arts with a major in informatics requires a minimum of 120 s.h., including at least 43-51 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 offers the cognate areas of art, economics, geoinformatics, health informatics, human-computer interaction, linguistics, media, music, social informatics, and individualized cognates.

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

Students must complete at least four courses (minimum of 12 s.h.) at the University of Iowa from the following: CS:3910 Informatics Project and three additional courses numbered CS:2500-CS:4990 or MSCI:4220 Advanced Database Management and Big Data.

The B.A. 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>3</td>
</tr>
<tr>
<td>Statistics Course</td>
<td>3-4</td>
</tr>
<tr>
<td>Cognate Courses</td>
<td>18-25</td>
</tr>
<tr>
<td>Total Hours</td>
<td>43-51</td>
</tr>
</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 application-oriented content than the traditional computer science curriculum yet is designed to offer students a sound basis in underlying computer science themes and techniques.

This course:

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

Informatics Electives

Students must complete at least one course (3 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>Course</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSCI:4220</td>
<td>Advanced Database Management and Big Data</td>
</tr>
<tr>
<td>A computer science course (prefix CS) numbered 3000-4990, except CS:3910</td>
<td></td>
</tr>
</tbody>
</table>

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. Those who choose the psychology courses option of the human-computer interaction cognate must satisfy the statistic’s requirement with PSY:2811 Research Methods and Data Analysis in Psychology I.

One of these:
PSY:2811 Research Methods and Data Analysis in Psychology I (only for students who select the psychology courses option of the human-computer interaction cognate) 3
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

**Cognates**

Students must complete all requirements listed under one of the cognate areas below: art, economics, geoinformatics, health informatics, human-computer interaction, linguistics, media, music, social informatics, or an individualized cognate.

**Art**

The informatics major with the art cognate requires a minimum of 48 s.h. of work for the major, including 22 s.h. in cognate courses. Students learn about the design and maintenance of web services, applications of modern computerized artistic tools, and benefits and limitations of computers as a digital medium. They also gain insight into computerized tool design that is guided by knowledge of an artist’s requirements. The art cognate may lead to careers in web development, technology coordination for artistic productions, development of digital artistic tools, and artistic or technical development for entertainment companies. Cognate courses are primarily in art history, design, elements of art, and photography.

Some courses listed below are open only to students majoring in art, so they are appropriate choices only for students with a double major in art and informatics. Non-art majors should work with an informatics faculty advisor to develop an individual set of art cognate courses.

All of these:
- ARTS:1510 Basic Drawing 3
- ARTS:1520 Design Fundamentals 3
- DSGN:2500 Graphic Design I 3
- DSGN:2600 Graphic Design II 3
- DSGN:3500 Graphic Design III 4

Any art history course (prefix ARTH) numbered at the 1000 or 2000 level 3

One of these, to complete 22 s.h. for the art cognate:
- CS:2800 Digital Arts: An Introduction 3
- DSGN:3600 Graphic Design IV 4
- MUSM:3125 Museums in a Digital World 3
- SCLP:3840 Robotic Art Studio 4
- SCLP:4830 Motion and Mechanisms 4

SCLP:4835 Electronic Objects and Spaces 4
SCLP:4840 Air, Actuators, and Motors 4

**Economics**

The informatics major with the economics cognate requires a minimum of 49 s.h. of work for the major, including 24 s.h. in cognate courses, which are primarily from economics. The economics cognate is intended for students interested in working with economic, financial, or demographic data. It may lead to careers in administration, business, or government or to graduate study in management or policy areas.

All of these:
- ECON:1100 Principles of Microeconomics 4
- ECON:1200 Principles of Macroeconomics 4
- ECON:3100 Intermediate Microeconomics 3
- ECON:3150 Intermediate Macroeconomics 3
- MATH:1380 Calculus and Matrix Algebra for Business 4

Additional 6 s.h. in economics courses (prefix ECON) numbered 3000 or above

**Geoinformatics**

The informatics major with the geoinformatics cognate requires a minimum of 47 s.h. of work for the major, including 22 s.h. in cognate courses, which are primarily from geographical and sustainability sciences. The geoinformatics cognate is intended for students interested in geographic information systems (GIS) and spatial aspects of data. It may lead to careers in business, government, or public health or to graduate study in geography, public health, or policy areas.

All of these:
- GEOG:1020 The Global Environment 3
- GEOG:1021 The Global Environment Lab 1
- GEOG:1050 Foundations of GIS 3

Two of these:
- GEOG:1070 Contemporary Environmental Issues 3
- GEOG:2110 Seven Billion and Counting: Introduction to Population Dynamics 3
- GEOG:2910 The Global Economy 3

One of these:
- GEOG:3520 GIS for Environmental Studies 3
- GEOG:3570 Light Detection and Ranging (LiDAR): Principles and Applications 3

Two geographical and sustainability sciences courses (prefix GEOG) numbered 3500 or above (at least 6 s.h.)

**Health Informatics**

The informatics major with the health informatics cognate requires a minimum of 46 s.h. of work for the major, including 21 s.h. in cognate courses. The health informatics cognate is intended for students interested in applications of computing to health care, especially in public health. It may lead to careers in medical or health-related areas or to graduate study in geography, public health, or policy areas.
and professional degree programs in public health, health informatics, and medical informatics. Cognate courses are selected primarily from public health, geography, and global health studies.

Once students complete the required courses in each of the four sets below, they must select additional courses from the sets to complete 21 s.h. of credit for the cognate.

One of these:
- CPH:1400 Fundamentals of Public Health 3
- GHS:3720 Contemporary Issues in Global Health 3

At least two of these:
- GEOG:1050 Foundations of GIS 3
- GEOG:4150 Health and Environment: GIS Applications 3

Any geographical and sustainability sciences course (prefix GEOG) numbered 3500 or above
At least two of these:
- GHS:3850 Promoting Health Globally 3
- GHS:4100 Topics in Global Health 1-3
- JMC:3150 Media and Health 3
One of these:
- EPID:4400 Epidemiology I: Principles 3
- HMP:4000 Introduction to the U.S. Health Care System 3

Human-Computer Interaction

The informatics major with the human-computer interaction cognate requires a minimum of 46 s.h. of work for the major, including at least 21 s.h. in cognate courses. The human-computer interaction cognate is intended for students interested in designing useful and usable technologies. It can lead to careers in interaction design, web design, implementation of user interfaces, and evaluation of human-computer interactions as well as provide valuable skills for implementation of user interfaces, and evaluation of human-computer interaction. The cognate's courses are drawn largely from psychology, sociology, and industrial engineering. Four required courses include foundational aspects of psychology or sociology, an examination of basic human abilities and performance relevant to information technology use, and an introduction to research topics in human-computer interaction.

This course:
- CS:4500 Research Methods in Human-Computer Interaction 3

Either both psychology courses or both sociology courses:
- PSY:1001 & PSY:2601 Elementary Psychology - Introduction to Cognitive Psychology 6
- SOC:1010 & SOC:2130 Introduction to Sociology - Sociological Theory 6-7

One art course from these:
- ARTS:1020 Elements of 3-D Design 3
- ARTS:1070 Elements of Graphic Design (recommended) 3
- ARTS:1090 Elements of Animation 3
One of these:
- IE:3400 Human Factors 3
- PSY:2401 Introduction to Developmental Science 3
- PSY:2501 Introduction to Social Psychology 3
- PSY:2701 Introduction to Behavioral Neuroscience 4

Two additional computer science courses (prefix CS) numbered 3000 or above, except CS:5990, to complete 21 s.h. for the human-computer interaction cognate
Most courses in this list have prerequisites, which students must complete before they may register for the course. The psychology courses (prefix PSY) require PSY:1001 Elementary Psychology and/or PSY:2701 Introduction to Behavioral Neuroscience as prerequisite(s). Students should choose courses from this list carefully.

Linguistics

The informatics major with the linguistics cognate requires a minimum of 47 s.h. of work for the major, including at least 22 s.h. in cognate courses. Linguistics, the scientific study of human languages, is directly related to psychology, anthropology, and computer science as well as to more applied fields such as second language acquisition or speech and hearing science. The cognate focuses on computational representations of syntax and semantics for processing natural language. Cognate courses are drawn primarily from linguistics.

All of these:
- CSD:3112 Anatomy and Physiology of Speech Production 4
- CSD:3116 Basic Neuroscience for Speech and Hearing 3
- LING:3001 Introduction to Linguistics 3
- LING:3005 Articulatory and Acoustic Phonetics 3
- LING:3010 Syntactic Analysis 3
- LING:3020 Phonological Analysis 3
- LING:3080 History of the English Language 3

Media

The informatics major with the media cognate requires a minimum of 48 s.h. of work for the major, including 23 s.h. in cognate courses. This cognate is intended for students interested in working in media industries. Data-specific occupations in these industries include, but are not limited to, data/communication analyst, data mining expert, strategic analyst, data journalist, web developer, information graphics specialist, app developer, and multimedia journalist.

JMC:2010 Journalistic Reporting and Writing and JMC:2020 Introduction to Multimedia Storytelling are corequisites and must be taken during the same semester. Students are responsible for completing the prerequisites for JMC:2010.

Both of these:
- JMC:2010 Journalistic Reporting and Writing 4
- JMC:2020 Introduction to Multimedia Storytelling 4

One of these:
- JMC:2200 Principles of Strategic Communication 3
JMC:2300 Principles of Journalism 3
One of these:
JMC:3610 Graphic Design 3-4
JMC:3640 Data Journalism 3-4
At least three journalism and mass communication courses (prefix JMC) numbered 3400 or above to complete 23 s.h. for the media cognate

Music
The informatics major with the music cognate requires a minimum of 48 s.h. of work for the major, including 23 s.h. in cognate courses. The music cognate is intended for students interested in audio recording, manipulation of sound, and digital media. It may help students prepare for careers in the entertainment industry. Cognate courses are primarily from music, with some from cinematic arts and theatre arts. Entering students must possess basic musicianship skills; an audition may be required for admission.

Students who plan to take MUS:1201 Musicianship and Theory I or MUS:1202 Musicianship and Theory II must take the music theory diagnostic examination, which is administered online during summer, before fall semester begins. See Musicianship and Theory Placement on the School of Music website for more information. Advanced placement in School of Music courses does not reduce the number of semester hours required for the cognate.

All of these:
MUS:1200 Fundamentals of Music for Majors 3
MUS:1201 Musicianship and Theory I 4
MUS:1202 Musicianship and Theory II 4
MUS:1211 Group Instruction in Piano I 1
MUS:1212 Group Instruction in Piano II 1
MUS:3780 Audio Recording I 3
MUS:3781 Audio Recording II 3
One of these:
MUS:1310 World Music 3
MUS:1720 History of Jazz 3
MUS:2301 History of Music I 3
MUS:2302 History of Music II 3
MUS:2311 Music of Latin America and the Caribbean 3
At least one of these, to complete 23 s.h. for the music cognate:
CS:2800 Digital Arts: An Introduction 3
CINE:4841 Film/Video Production: Sound Design 4
MUS:1007 Garage Band: The Basics 2
MUS:1010 Recital Attendance for Non-Majors 1
THTR:3260 Sound Design for the Theatre 3

Social Informatics
The informatics major with the social informatics cognate requires a minimum of 45 s.h. of work for the major, including 20 s.h. in cognate courses, all from the Department of Sociology.

SOC:1010 Introduction to Sociology 3-4
SOC:2130 Sociological Theory 3
SOC:2170 Research Methods 3
At least 11 s.h. from these:
CRIM:1410 Introduction to Criminology 3
CRIM:3420 Juvenile Delinquency 3
CRIM:3450 Criminal Legal System 3
CRIM:4400 Internship in Criminal Justice and Corrections 3

Any sociology course (prefix SOC) numbered 1020 or above

Individualized Cognates
Students interested in developing individualized cognates may work with an informatics faculty advisor. Individualized cognates may be drawn primarily from one department or an appropriate mix of departments; they require an approved set of cognate courses totaling 18-25 s.h.

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 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.

## Sample Plan of Study

**Informatics (B.A.)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Year</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fall</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CS:1110</td>
<td>Introduction to Computer Science</td>
<td>3</td>
</tr>
<tr>
<td>RHET:1030</td>
<td>Rhetoric (GE: Rhetoric or other General Education course)</td>
<td>4</td>
</tr>
<tr>
<td>Major: math course (if required by cognate) or elective course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>GE: World Languages or elective course</td>
<td>3-5</td>
<td></td>
</tr>
<tr>
<td>CSI:1600</td>
<td>Success at Iowa</td>
<td>2</td>
</tr>
<tr>
<td><strong>Hours</strong></td>
<td></td>
<td>15-17</td>
</tr>
<tr>
<td><strong>Spring</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CS:2110</td>
<td>Programming for Informatics</td>
<td>4</td>
</tr>
<tr>
<td>ENGL:1200</td>
<td>The Interpretation of Literature (GE: Interpretation of Literature)</td>
<td>3</td>
</tr>
<tr>
<td>Major: elementary, business, or other statistics course (prefix STAT)</td>
<td>3-4</td>
<td></td>
</tr>
<tr>
<td>GE: Diversity and Inclusion</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>GE: World Languages or elective course</td>
<td>3-5</td>
<td></td>
</tr>
<tr>
<td><strong>Hours</strong></td>
<td></td>
<td>16-19</td>
</tr>
<tr>
<td><strong>Second Year</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fall</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CS:2520</td>
<td>Human-Computer Interaction</td>
<td>3</td>
</tr>
<tr>
<td>Major: informatics cognate elective course</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>GE: Literary, Visual, and Performing Arts</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>GE: World Languages or elective course</td>
<td>3-5</td>
<td></td>
</tr>
<tr>
<td>Elective course</td>
<td>2-3</td>
<td></td>
</tr>
<tr>
<td><strong>Hours</strong></td>
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<td>15-18</td>
</tr>
<tr>
<td><strong>Spring</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CS:2620</td>
<td>Networking and Security for Informatics</td>
<td>3</td>
</tr>
<tr>
<td>Major: informatics cognate elective course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Major: informatics cognate elective course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>GE: World Languages or elective course</td>
<td>3-5</td>
<td></td>
</tr>
<tr>
<td>Elective course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Hours</strong></td>
<td></td>
<td>15-17</td>
</tr>
<tr>
<td><strong>Third Year</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fall</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSCI:3200</td>
<td>Database Management</td>
<td>3</td>
</tr>
<tr>
<td>Major: informatics cognate elective course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>GE: International and Global Issues</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>GE: Natural Sciences with a lab</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Elective course</td>
<td>2-3</td>
<td></td>
</tr>
<tr>
<td><strong>Hours</strong></td>
<td></td>
<td>15-16</td>
</tr>
<tr>
<td><strong>Spring</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Major: informatics computer science elective course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Major: informatics cognate elective course</td>
<td>3</td>
<td></td>
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</tbody>
</table>

**Fourth Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fall</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CS:3910</td>
<td>Informatics Project</td>
<td>3</td>
</tr>
<tr>
<td>Major: informatics cognate elective course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>GE: Historical Perspectives</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Elective course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Hours</strong></td>
<td></td>
<td>15</td>
</tr>
<tr>
<td><strong>Spring</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Major: informatics cognate elective course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>GE: Social Sciences</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Elective course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Elective course</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td><strong>Hours</strong></td>
<td></td>
<td>15</td>
</tr>
<tr>
<td><strong>Total Hours</strong></td>
<td></td>
<td>121-132</td>
</tr>
</tbody>
</table>

1. General Education (GE) courses may be completed in any order unless used as a prerequisite for another course. Students should consult with an advisor about the best sequencing of courses. For more information, view the General Education Program.
2. Enrollment in chemistry and math courses require completion of placement exams.
3. Students who have completed four years of a single language in high school have satisfied the College of Liberal Arts and Sciences GE: World Languages requirement. Enrollment in world languages courses requires a placement exam, unless enrolling in a first-semester-level course.
4. The B.A. requires 18-25 s.h. in one cognate field. This sample plan of study includes 24 s.h. of cognate elective courses.
5. Students may use their elective courses to complete a double major, minors, or certificates.

## 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.