2021 - 2022 Major Map
Informatics, BS

School/College: Ira A. Fulton Schools of Engineering
Location: Tempe campus
ESCPiBS

### Term 1 0 - 16 Credit Hours

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPI 101: Introduction to Informatics (CS)</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>CSE 110: Principles of Programming (CS)</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>ASU 101-CSE: The ASU Experience</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENG 101 or ENG 102: First-Year Composition OR ENG 105: Advanced First-Year Composition OR ENG 107 or ENG 108: First-Year Composition</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>MAT 210: Brief Calculus (MA) OR MAT 265: Calculus for Engineers I (MA)</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>Social-Behavioral Sciences (SB) AND Global Awareness (G)</td>
<td>3</td>
<td></td>
<td>Complete Mathematics (MA) requirement.</td>
</tr>
</tbody>
</table>

Term hours subtotal: 16

### Term 2 16 - 30 Credit Hours

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSE 205: Object-Oriented Programming and Data Structures (CS)</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>MAT 242: Elementary Linear Algebra</td>
<td>2</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>ENG 101 or ENG 102: First-Year Composition OR ENG 105: Advanced First-Year Composition OR ENG 107 or ENG 108: First-Year Composition</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>Humanities, Arts and Design (HU) AND Cultural Diversity in the U.S. (C)</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower Division Elective</td>
<td>3</td>
<td></td>
<td>Complete ENG 101 OR ENG 105 OR ENG 107 course(s).</td>
</tr>
<tr>
<td>Complete MAT 210 OR MAT 251 OR MAT 265 OR MAT 270 course(s).</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Term hours subtotal: 14

### Term 3 30 - 46 Credit Hours

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPI 220: Applied Data Structures and Algorithms</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>MAT 243: Discrete Mathematical Structures</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>IEE 305: Information Systems Engineering (CS)</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>Natural Science - Quantitative (SQ)</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social-Behavioral Sciences (SB) AND Historical Awareness (H)</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Complete First-Year Composition requirement.</td>
<td></td>
<td></td>
<td>Complete Mathematics (MA) requirement.</td>
</tr>
</tbody>
</table>

- ASU 101 or college-specific equivalent First-Year Seminar (ASU 101-CSE) required of all first-year students.
- If ENG 105 is taken, a three (3) credit hour elective must also be taken prior to graduation.
- Prep for success using the First-Year Student Guide.
- Join a Fulton community.
- Explore engineering and technical professions.

- Create a Handshake profile.
- Get involved with EPICS, the Generator Labs, and the Fulton Start-Up Center.
- Prep for success using the Sophomore Guide.
### Term 4 46 - 62 Credit Hours

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPI 200: Mathematical Foundations of Informatics (MA)</td>
<td>3</td>
<td>C</td>
<td>* Pursue an undergraduate research experience.</td>
</tr>
<tr>
<td>CPI 221: Advanced Object-Oriented Principles Using Java</td>
<td>3</td>
<td>C</td>
<td>* Apply for internships.</td>
</tr>
<tr>
<td>Informatics Focus Area</td>
<td>3</td>
<td>C</td>
<td>* Attend career fairs and events.</td>
</tr>
<tr>
<td>Humanities, Arts and Design (HU)</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural Science - Quantitative (SQ) OR Natural Science - General (SG)</td>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Term hours subtotal: 16

### Term 5 62 - 78 Credit Hours

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPI 200: Mathematical Foundations of Informatics (MA)</td>
<td>3</td>
<td>C</td>
<td>* Pursue an undergraduate research experience.</td>
</tr>
<tr>
<td>CPI 221: Advanced Object-Oriented Principles Using Java</td>
<td>3</td>
<td>C</td>
<td>* Apply for internships.</td>
</tr>
<tr>
<td>Informatics Focus Area</td>
<td>3</td>
<td>C</td>
<td>* Attend career fairs and events.</td>
</tr>
<tr>
<td>Humanities, Arts and Design (HU)</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural Science - Quantitative (SQ) OR Natural Science - General (SG)</td>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Term hours subtotal: 16

### Term 6 78 - 93 Credit Hours

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPI 360: Decision Making and Problem Solving</td>
<td>3</td>
<td>C</td>
<td>* Students who plan to pursue the Enterprise Informatics Focus Area will need to take IEE 380 for the CS requirement.</td>
</tr>
<tr>
<td>CSE 301: Computing Ethics</td>
<td>1</td>
<td>C</td>
<td>* Network at student organization competitions or professional societies.</td>
</tr>
<tr>
<td>Complete 2 courses:</td>
<td>6</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>Informatics Focus Area</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Term hours subtotal: 16

### Term 7 93 - 108 Credit Hours

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSE 485: Computer Science Capstone Project I (L)</td>
<td>3</td>
<td>C</td>
<td>* Plan for success using the Senior Guide.</td>
</tr>
<tr>
<td>Complete 4 courses:</td>
<td>12</td>
<td>C</td>
<td>* Use Handshake to apply for full-time positions.</td>
</tr>
<tr>
<td>Upper Division Informatics Elective</td>
<td></td>
<td></td>
<td>* Complete an in person or virtual practice interview.</td>
</tr>
</tbody>
</table>

Term hours subtotal: 15

### Term 8 108 - 120 Credit Hours

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSE 488: Computer Science Capstone Project II (L)</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>Complete 3 courses:</td>
<td>9</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>Upper Division Informatics Elective</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Term hours subtotal: 12
Informatics Focus Area and Informatics Electives: Select a focus area and complete at least 15 hours in that focus area. Select another 21 hours from the courses on these lists to complete the 36-hour requirement. Students will need to take 21 of the 36 total hours as upper-division (300 or 400-level courses). It is recommended that you work with your academic advisor when making course selections. Visit the CIDSE website for additional information about Informatics Electives or Focus Area Required Courses.

### Informatics Focus Area (Data Science)
- CSE 450: Design and Analysis of Algorithms
- CSE 467: Data and Information Security
- CSE 471: Introduction to Artificial Intelligence
- CSE 475: Foundations of Machine Learning
- CSE 476: Introduction to Natural Language Processing
- DAT 250: Data Science and Society
- DAT 300: Mathematical Tools for Data Science
- DAT 301: Exploring Data in R and Python
- DAT 401: Statistical Modeling and Inference for Data Science
- DAT 402: Statistical Learning

### Informatics Focus Area (Digital Culture Studies)
Recommended first course is AME 111.
- AME 111: Introduction to Digital Culture (CS)
- AME 112: Computational Thinking for Digital Culture
- AME 130: Prototyping Dreams (L)
- AME 220: Programming for the Web
- AME 230: Programming for the Media Arts (CS)
- AME 240: Introduction to Physical Computing
- AME 3** Elective
- AME 4** Elective
- ART 116: Introduction to Digital Media
- ART 206: Digital Photography I
- ART 217: Introduction to Computer Animation
- ART 218: 3D Tools
- ART 308: 2D Digital Animation
- ART 345: Visualization and Prototyping
- ART 346: 3-D Computer Imaging and Animation (CS)
- ART 348: Animation Motion Studies
- ART 394: 2D Computer Animation for Non-Majors
- ART 394: Digital Photography for Non-Majors
- ART 424: Stop Motion Animation
- ART 440: Experimental Video Art
- ART 494: Documentary Video Art
- ART 494: Visual Prototyping
- CIS 300: Web Design and Development
- CPI 111: Game Development I (CS)
- DCE 294: HybridAction:PhysicalIntelligenceinDigitalCulture
- EDT 440: Creating and Marketing Mobile Apps
- FMP 225: Introduction to Visual Effects
- FMP 240: Introduction to Animation for Film
- FMP 255: Media Authorship (CS)

### Informatics Focus Area (Enterprise Informatics)
- IEE 376: Operations Research
- IEE 385: Engineering Statistics: Probability
- IEE 407: Stochastic Operations Research
- MAT 266: Calculus for Engineers II (MA)

Select One:
- IEE 421: Urban Operations Research
- IEE 426: Operations Research in Healthcare
- IEE 461: Production Control
- IEE 474: Quality Control
- IEE 475: Simulating Stochastic Systems (CS)
- IEE 477: System Dynamics and Thinking
- SCM 300: Global Supply Operations
FMP 294: Sound Design: From Hollywood to Independent Film
FMP 394: Non-Linear Editing for Film and Media
GIT 135: Graphic Communications
GIT 215: Introduction to Web Authoring
GIT 230: Digital Illustration in Publishing
GRA 294: InDesign
IAP 103: Foundations I: Interdisciplinary Art Practice
IAP 104: Foundations I: Fundamentals of Sound Art
MDC 211: Introduction to Digital Sound
MDC 311: Composing and Performing for Hybrid Ensembles

Informatics Focus Area (Game Informatics)

Required:
- CPI 111: Game Development I (CS)
- CPI 211: Game Development II
- CPI 311: Game Engine Development
- CPI 321: Fundamentals of Game Art

Select one:
- CPI 394: Game Design Fundamentals
- CPI 411: Graphics for Games
- CPI 421: 3-D Modeling and Texturing
- CPI 462: Design for Learning in Virtual Worlds
- FMS 394: Video Games and Narrative
- SER 431: Advanced Graphics

Informatics Focus Area (Geo-Informatics)

Required:
- GIS 205: Geographic Information Science I (CS)
- GIS 211: Geographic Information Science II (CS)
- GIS 311: Geographic Information Science III (CS)

Select two:
- ABS 485: GIS in Natural Resources
- GCU 441: Economic Geography (SB)
- GCU 442: Geographical Analysis of Transportation (SB)
- GIS 222: Programming Principles in GIS I
- GIS 322: Programming Principles in GIS II
- GIS 341: Cartography and Georepresentation (CS)
- GIS 461: Fundamentals of Spatial Optimization
- GIS 462: Location Analysis and Modeling
- GIS 470: Advanced Statistics for Geography and Planning (CS)
- GIS 471: Spatial Statistics for Geography and Planning
- GIS 494: Data Mining and Data-Driven Geography

Additional Informatics Electives

Students may take additional coursework from their selected focus area or any course in another focus area as Informatics Electives in addition to the courses listed below:
- AME 394: Philosophies of Technology
- BIO 355: Introduction to Computational Molecular Biology (CS)
- BIO 411: Quantitative Methods in Conservation and Ecology
- BMI 102: Introduction to Population Health Informatics
- BMI 201: Introduction to Clinical Informatics
- CIS 308: Advanced Excel in Business
- CIS 365: Business Database Systems Development
- CPI 394: Special Topics
- CPI 441: Gaming Capstone
- CPI 460: Intelligent Interactive Instructional Systems
- CPI 484: Internship
- CPI 494: Special Topics
- CSE 220: Programming for Computer Engineering
- CSE 240: Introduction to Programming Languages
- CSE 259: Logic in Computer Science
- CSE 294: Algorithmic Problem Solving
Notes:

- First-Year Composition: All students are placed in ENG 101 unless submission of SAT, ACT, Accuplacer, IELTS, or TOEFL score, or college-level transfer credit or test credit equivalent to ASU's first-year composition course(s), determine otherwise. Students on Polytechnic, Downtown Phoenix and West Campuses are encouraged to complete the Directed Self-Placement survey to choose the first-year composition option they believe best suits their needs. Visit: https://cisa.asu.edu/DSP
- Mathematics Placement Assessment score determines placement in first mathematics course.

**Total Hours:** 120
**Upper Division Hours:** 45 minimum
**Major GPA:** 2.00 minimum
**Cumulative GPA:** 2.00 minimum
**Total hrs at ASU:** 30 minimum
**Hrs Resident Credit for Academic Recognition:** 56 minimum
**Total Community College Hrs:** 64 maximum

**General University Requirements Legend**

General Studies Core Requirements:
- Literacy and Critical Inquiry (L)
- Mathematical Studies (MA)
- Computer/Statistics/Quantitative Applications (CS)
- Humanities, Arts and Design (HU)
- Social-Behavioral Sciences (SB)
- Natural Science - Quantitative (SQ)
- Natural Science - General (SG)

General Studies Awareness Requirements:
- Cultural Diversity in the U.S. (C)
- Global Awareness (G)
- Historical Awareness (H)

First-Year Composition

General Studies designations listed on the major map are current for the 2021 - 2022 academic year.