## 2018 - 2019 Major Map

**Informatics, BS**

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

### ESCPIBS

<table>
<thead>
<tr>
<th>Term 1 - 16 Credit Hours</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Critical course signified by ★</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<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 with Java (CS)</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>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>Social-Behavioral Sciences (SB) AND Global Awareness (G)</td>
<td>3</td>
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<tr>
<td><strong>Term hours subtotal:</strong></td>
<td><strong>16</strong></td>
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Term 2 16 - 30 Credit Hours

<table>
<thead>
<tr>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
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<tbody>
<tr>
<td><strong>Critical course signified by ★</strong></td>
<td></td>
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<tr>
<td>CSE 205: Object-Oriented Programming and Data Structures (CS)</td>
<td>3</td>
<td>C</td>
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<tr>
<td>MAT 242: Elementary Linear Algebra</td>
<td>2</td>
<td>C</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>
</tr>
<tr>
<td>Humanities, Arts and Design (HU) AND Cultural Diversity in the U.S. (C)</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Literacy and Critical Inquiry (L)</td>
<td>3</td>
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</tr>
<tr>
<td><strong>Complete ENG 101 OR ENG 105 OR ENG 107 course(s).</strong></td>
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<tr>
<td><strong>Term hours subtotal:</strong></td>
<td><strong>14</strong></td>
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Term 3 30 - 46 Credit Hours

<table>
<thead>
<tr>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
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<tbody>
<tr>
<td><strong>Critical course signified by ★</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CPI 220: Applied Data Structures and Algorithms</td>
<td>3</td>
<td>C</td>
</tr>
<tr>
<td>MAT 243: Discrete Mathematical Structures</td>
<td>3</td>
<td>C</td>
</tr>
<tr>
<td>IEE 305: Information Systems Engineering (CS)</td>
<td>3</td>
<td>C</td>
</tr>
<tr>
<td>Natural Science - Quantitative (SQ)</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Social-Behavioral Sciences (SB) AND Historical Awareness (H)</td>
<td>3</td>
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<tr>
<td><strong>Complete Mathematics (MA) requirement.</strong></td>
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<tr>
<td><strong>Term hours subtotal:</strong></td>
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Term 4 46 - 62 Credit Hours

<table>
<thead>
<tr>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Critical course signified by ★</strong></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Term hours subtotal:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Hours</td>
</tr>
<tr>
<td>-------------</td>
<td>--------------</td>
<td>-------</td>
</tr>
<tr>
<td>CPI 200:</td>
<td>Mathematical Foundations of Informatics (MA)</td>
<td>3</td>
</tr>
<tr>
<td>CPI 221:</td>
<td>Advanced Object-Oriented Principles Using Java</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Informatics Focus Area</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Humanities, Arts and Design (HU)</td>
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<tr>
<td></td>
<td>Natural Science - General (SG)</td>
<td>4</td>
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**Term hours subtotal:** 16

<table>
<thead>
<tr>
<th>Term 5 62 - 77 Credit Hours</th>
<th>Necessary course signified by ★</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
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</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>
<td></td>
</tr>
<tr>
<td>Complete 2 courses: Informatics Focus Area</td>
<td>6</td>
<td>C</td>
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</table>

**Term hours subtotal:** 15

<table>
<thead>
<tr>
<th>Term 6 77 - 92 Credit Hours</th>
<th>Necessary course signified by ★</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>★ CPI 350: Evaluation of Informatics Systems</td>
<td>3</td>
<td>C</td>
<td>Research and prepare for graduate school.</td>
<td></td>
</tr>
<tr>
<td>★ CSE 463: Introduction to Human Computer Interaction</td>
<td>3</td>
<td>C</td>
<td>Apply for an engineering 4+1 program.</td>
<td></td>
</tr>
<tr>
<td>Complete 2 courses: Informatics Focus Area</td>
<td>6</td>
<td>C</td>
<td>Develop a professional profile online.</td>
<td></td>
</tr>
<tr>
<td>Upper Division Humanities, Arts and Design (HU) OR Upper Division Social-Behavioral Sciences (SB)</td>
<td>3</td>
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<td></td>
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</tr>
<tr>
<td>Complete Cultural Diversity in the U.S. (C) AND Global Awareness (G) AND Historical Awareness (H) course(s).</td>
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**Term hours subtotal:** 15

<table>
<thead>
<tr>
<th>Term 7 92 - 107 Credit Hours</th>
<th>Necessary course signified by ★</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>★ CPI 485: Informatics Capstone I (L)</td>
<td>3</td>
<td>C</td>
<td>Plan for success using the Senior Guide.</td>
<td></td>
</tr>
<tr>
<td>Complete 4 courses: Upper Division Informatics Elective</td>
<td>12</td>
<td>C</td>
<td>Use Handshake to apply for full-time positions.</td>
<td></td>
</tr>
<tr>
<td>Term hours subtotal:</td>
<td>15</td>
<td></td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Term 8 107 - 120 Credit Hours</th>
<th>Necessary course signified by ★</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>★ CPI 486: Informatics Capstone II (L)</td>
<td>4</td>
<td>C</td>
<td>Complete an in-person or practice interview.</td>
<td></td>
</tr>
<tr>
<td>Complete 3 courses: Upper Division Informatics Elective</td>
<td>9</td>
<td>C</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Term hours subtotal:** 13
- 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 300/400 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 (Game Informatics)

| 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 |
| AND CPI 111: Game Development I (CS) AND CPI 211: Game Development II AND CPI 311: Game Engine Development AND CPI 321: Fundamentals of Game Art AND Select one: |
| CPI 411: Graphics for Games |
| CPI 412: Cognitive Systems and Intelligent Agents |
| CPI 421: 3-D Modeling and Texturing |
| CPI 422: 3-D Animation and Rigging for Video Games |
| CPI 462: Design for Learning in Virtual Worlds |
| Select One: |
| CPI 411: Graphics for Games |
| CPI 412: Cognitive Systems and Intelligent Agents |
| CPI 421: 3-D Modeling and Texturing |
| CPI 422: 3-D Animation and Rigging for Video Games |
| CPI 462: Design for Learning in Virtual Worlds |

Select two:

- ABS 485: GIS in Natural Resources
- GCU 361: Urban Geography (SB)
- GCU 441: Economic Geography (SB)
- GCU 442: Geographical Analysis of Transportation (SB)
- GCU 494: Special Topics
- GIS 341: Introduction to Cartography and Georepresentation (CS)
- GIS 351: Air Photo Interpretation
- GIS 461: Optimization Fundamentals for Spatial Analysis
- GIS 471: Spatial Statistics for Geography and Planning

### 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 361: Urban Geography (SB)
- GCU 441: Economic Geography (SB)
- GCU 442: Geographical Analysis of Transportation (SB)
- GCU 494: Special Topics
- GIS 341: Introduction to Cartography and Georepresentation (CS)
- GIS 351: Air Photo Interpretation
- GIS 461: Optimization Fundamentals for Spatial Analysis
- GIS 471: Spatial Statistics for Geography and Planning

### 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 294: Introduction to Physical Computing |
| AME 310: Media Literacies and Composition |
| AME 320: Motion Capture for Integrative Systems |
| AME 330: Digital-Physical Systems |

### Additional Informatics Electives

Students may choose from any of the courses not in their selected focus area as Informatics Electives in addition to the courses listed below:

- AME 394: Philosophies of Technology
- ART 346: 3-D Computer Imaging and Animation (CS)
- BIO 355: Introduction to Computational Molecular Biology (CS)
- BIO 411: Quantitative Methods in Conservation and Ecology
- BIO 424: Dynamic Modeling in Social and Ecological Systems
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>AME 340</td>
<td>Compositional and Computational Principles for Media Arts</td>
</tr>
<tr>
<td>AME 394</td>
<td>Media Theatre</td>
</tr>
<tr>
<td>AME 394</td>
<td>Technical Lives</td>
</tr>
<tr>
<td>AME 430</td>
<td>Mac Development for Media Arts</td>
</tr>
<tr>
<td>AME 470</td>
<td>Programming for Social and Interactive Media</td>
</tr>
<tr>
<td>AME 494</td>
<td>Animating Virtual Worlds</td>
</tr>
<tr>
<td>ANP 394</td>
<td>Digital Modeling and Fabrication</td>
</tr>
<tr>
<td>ANP 494</td>
<td>Design by Algorithm</td>
</tr>
<tr>
<td>ANP 494</td>
<td>Designing Hybrid Spaces</td>
</tr>
<tr>
<td>ART 116</td>
<td>Introduction to Digital Media</td>
</tr>
<tr>
<td>ART 206</td>
<td>Digital Photography I: The Still Image in Digital Culture</td>
</tr>
<tr>
<td>ART 218</td>
<td>3D Tools</td>
</tr>
<tr>
<td>ART 345</td>
<td>Visualization and Prototyping</td>
</tr>
<tr>
<td>DCE 294</td>
<td>HybridAction:PhysicalIntelligenceinDigitalCulture</td>
</tr>
<tr>
<td>FMP 240</td>
<td>Introduction to Animation for Film</td>
</tr>
<tr>
<td>FMP 294</td>
<td>Story Development for Game Design</td>
</tr>
<tr>
<td>FMP 394</td>
<td>Non-Linear Editing for Film and Media</td>
</tr>
<tr>
<td>IAP 103</td>
<td>Foundations I: Interdisciplinary Digital Media</td>
</tr>
<tr>
<td>IAP 104</td>
<td>Foundations I: Fundamentals of Sound Art</td>
</tr>
<tr>
<td>MDC 211</td>
<td>Introduction to Digital Sound</td>
</tr>
<tr>
<td>MDC 311</td>
<td>Composing and Performing for Hybrid Ensembles</td>
</tr>
<tr>
<td>BMI 102</td>
<td>Introduction to Public Health Informatics</td>
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<tr>
<td>CIS 300</td>
<td>Web Design and Development</td>
</tr>
<tr>
<td>CIS 365</td>
<td>Business Database Systems Development</td>
</tr>
<tr>
<td>CPI 441</td>
<td>Gaming Capstone</td>
</tr>
<tr>
<td>CPI 460</td>
<td>Intelligent Interactive Instructional Systems</td>
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<tr>
<td>CPI 484</td>
<td>Internship</td>
</tr>
<tr>
<td>CPI 494</td>
<td>Special Topics</td>
</tr>
<tr>
<td>CSE 220</td>
<td>Programming for Computer Engineering</td>
</tr>
<tr>
<td>CSE 240</td>
<td>Introduction to Programming Languages</td>
</tr>
<tr>
<td>CSE 259</td>
<td>Logic in Computer Science</td>
</tr>
<tr>
<td>CSE 294</td>
<td>Algorithmic Problem Solving</td>
</tr>
<tr>
<td>CSE 310</td>
<td>Data Structures and Algorithms</td>
</tr>
<tr>
<td>CSE 335</td>
<td>Principles of Mobile Application Development</td>
</tr>
<tr>
<td>CSE 360</td>
<td>Introduction to Software Engineering</td>
</tr>
<tr>
<td>CSE 394</td>
<td>Special Topics</td>
</tr>
<tr>
<td>CSE 408</td>
<td>Multimedia Information Systems</td>
</tr>
<tr>
<td>CSE 412</td>
<td>Database Management</td>
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<td>CSE 471</td>
<td>Introduction to Artificial Intelligence</td>
</tr>
<tr>
<td>CSE 476</td>
<td>Introduction to Natural Language Processing</td>
</tr>
<tr>
<td>CSE 477</td>
<td>Introduction to Computer-Aided Geometric Design or CSE 494: Special Topics</td>
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<tr>
<td>FSE 301</td>
<td>Entrepreneurship and Value Creation</td>
</tr>
<tr>
<td>FSE 494</td>
<td>EPICS Gold III</td>
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<tr>
<td>GIT 135</td>
<td>Graphic Communications</td>
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<tr>
<td>GIT 230</td>
<td>Digital Illustration in Publishing</td>
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<td>GIT 335</td>
<td>Computer Systems Technology</td>
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<td>GRA 294</td>
<td>InDesign</td>
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<td>GRA 294</td>
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<tr>
<td>HSE 101</td>
<td>Introduction to Human Systems Engineering (SB)</td>
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<td>IEE 385</td>
<td>Engineering Statistics: Probability</td>
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<tr>
<td>MAT 267</td>
<td>Calculus for Engineers III (MA)</td>
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<tr>
<td>SER 316</td>
<td>Software Enterprise: Construction and Transition</td>
</tr>
<tr>
<td>SER 334</td>
<td>Operating Systems and Networks</td>
</tr>
<tr>
<td>SOC 334</td>
<td>Technology and Society (L or SB)</td>
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<tr>
<td>STS 304</td>
<td>Science, Technology, and Society (SB)</td>
</tr>
<tr>
<td>TEL 313</td>
<td>Technology in an Educational Setting</td>
</tr>
<tr>
<td>TWC 414</td>
<td>Visualizing Data and Information</td>
</tr>
<tr>
<td>TWC 444</td>
<td>User Experience</td>
</tr>
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</table>

**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 2018 - 2019 academic year.