2019 - 2020 Major Map
Computer Systems Engineering, BSE

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

<table>
<thead>
<tr>
<th>Term 1 - 15 Credit Hours</th>
<th>Critical course signified by</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSE 110: Principles of Programming with Java (CS)</td>
<td>3</td>
<td>C</td>
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<tr>
<td>MAT 265: Calculus for Engineers I (MA)</td>
<td>3</td>
<td>C</td>
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<tr>
<td>ASU 101-CSE: The ASU Experience</td>
<td>1</td>
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<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>
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<tr>
<td>FSE 100: Introduction to Engineering</td>
<td>2</td>
<td>C</td>
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</tr>
<tr>
<td>Social-Behavioral Sciences (SB) AND Global Awareness (G)</td>
<td>3</td>
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<tr>
<td>Minimum 2.00 GPA ASU Cumulative.</td>
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Term hours subtotal: 15

Minimum 2.00 GPA ASU Cumulative.

• An SAT, ACT, Accuplacer, TOEFL or IELTS score determines placement into first-year composition courses.
• Mathematics Placement Assessment score determines placement in mathematics course.
• ASU 101 or College specific equivalent First Year Seminar required of all freshman students and should be taken in the first semester.
• If ENG 105 is taken, a three (3) semester hour elective must also be taken prior to graduation.
• Prep for success using the Freshman Guide.
• Join a Fulton community.
• Explore engineering and technical professions.

<table>
<thead>
<tr>
<th>Term 2 - 15 - 31 Credit Hours</th>
<th>Critical course signified by</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>
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</tr>
<tr>
<td>MAT 266: Calculus for Engineers II (MA)</td>
<td>3</td>
<td>C</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>
<td></td>
</tr>
<tr>
<td>Biology or Chemistry Course</td>
<td>4</td>
<td></td>
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<tr>
<td>Humanities, Arts and Design (HU) AND Cultural Diversity in the U.S. (C)</td>
<td>3</td>
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<tr>
<td>Complete ENG 101 OR ENG 105 OR ENG 107 course(s).</td>
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</tr>
<tr>
<td>Minimum 2.00 GPA ASU Cumulative.</td>
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Term hours subtotal: 16

Minimum 2.00 GPA ASU Cumulative.

• Create a Handshake profile.
• Get involved with EPICS, the Generator Labs, and the Fulton Start-Up Center.

<table>
<thead>
<tr>
<th>Term 3 - 31 - 47 Credit Hours</th>
<th>Critical course signified by</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSE 120: Digital Design Fundamentals</td>
<td>3</td>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MAT 243: Discrete Mathematical Structures</td>
<td>3</td>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MAT 267: Calculus for Engineers III (MA)</td>
<td>3</td>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHY 121: University Physics I: Mechanics (SQ)</td>
<td>3</td>
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</tr>
<tr>
<td>PHY 122: University Physics Laboratory I (SQ)</td>
<td>1</td>
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<tr>
<td>Social-Behavioral Sciences (SB) AND Historical Awareness (H)</td>
<td>3</td>
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<td></td>
</tr>
<tr>
<td>Minimum 2.00 GPA ASU Cumulative.</td>
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</tbody>
</table>

Complete Mathematics (MA) requirement.

• Prep for success using the Sophomore Guide.
• Consult the Resume, Presentation, and Resource Library for tips on how to create a technical resume, job shadow, do informational interviews and mentor with alumni.
### Term 4 47 - 63 Credit Hours

<table>
<thead>
<tr>
<th>Critical course signified by</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSE 220: Programming for Computer Engineering</td>
<td>3</td>
<td>C</td>
<td>• Pursue an undergraduate research experience.</td>
</tr>
<tr>
<td>CSE 230: Computer Organization and Assembly Language Programming</td>
<td>3</td>
<td>C</td>
<td>• Apply for internships.</td>
</tr>
<tr>
<td>MAT 275: Modern Differential Equations (MA)</td>
<td>3</td>
<td>C</td>
<td>• Attend career fairs and events.</td>
</tr>
<tr>
<td>PHY 131: University Physics II: Electricity and Magnetism (SQ)</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>PHY 132: University Physics Laboratory II (SQ)</td>
<td>1</td>
<td>C</td>
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</tr>
<tr>
<td>Humanities, Arts and Design (HU)</td>
<td>3</td>
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</tr>
</tbody>
</table>

**Term hours subtotal:** 16

### Term 5 63 - 77 Credit Hours

<table>
<thead>
<tr>
<th>Necessary course signified by</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSE 310: Data Structures and Algorithms</td>
<td>3</td>
<td>C</td>
<td>• Plan for success using the Junior Guide.</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>CSE 320: Design and Synthesis of Digital Hardware</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>EEE 202: Circuits I</td>
<td>4</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>IEE 380: Probability and Statistics for Engineering Problem Solving (CS)</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
</tbody>
</table>

**Term hours subtotal:** 14

### Term 6 77 - 93 Credit Hours

<table>
<thead>
<tr>
<th>Necessary course signified by</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSE 325: Embedded Microprocessor Systems</td>
<td>3</td>
<td>C</td>
<td>• Research and prepare for graduate school.</td>
</tr>
<tr>
<td>CSE 330: Operating Systems</td>
<td>3</td>
<td>C</td>
<td>• Apply for an engineering 4+1 program.</td>
</tr>
<tr>
<td>CSE 360: Introduction to Software Engineering</td>
<td>3</td>
<td>C</td>
<td>• Develop a professional profile online.</td>
</tr>
<tr>
<td>EEE 334: Circuits II</td>
<td>4</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>MAT 343: Applied Linear Algebra</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>Humanities, Arts and Design (HU) AND Global Awareness (G) AND Historical Awareness (H) course(s).</td>
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</tbody>
</table>

**Term hours subtotal:** 16

### Term 7 93 - 108 Credit Hours

<table>
<thead>
<tr>
<th>Necessary course signified by</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSE 423: Systems Capstone Project I (L)</td>
<td>3</td>
<td>C</td>
<td>• Please see course lists below for CSE Technical Electives. Contact CIDSE Advising or visit the CIDSE website for additional information. Maximum 6 hours at the 300-level.</td>
</tr>
<tr>
<td>CSE 434: Computer Networks</td>
<td>3</td>
<td>C</td>
<td>• Plan for success using the Senior Guide.</td>
</tr>
<tr>
<td>Complete 2 courses: Upper Division CSE Technical Elective</td>
<td>6</td>
<td>C</td>
<td>• Use Handshake to apply for full-time positions.</td>
</tr>
<tr>
<td>Upper Division Humanities, Arts and Design (HU) OR Upper Division Social-Behavioral Sciences (SB)</td>
<td>3</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>Necessary course signified by</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSE 424: Systems Capstone Project II (L)</td>
<td>3</td>
<td>C</td>
<td>• Please see course lists below for CSE Technical Electives. Contact CIDSE Advising or visit the CIDSE website for additional information. Maximum 6 hours at the 300-level.</td>
</tr>
<tr>
<td>CSE 420: Computer Architecture I</td>
<td>3</td>
<td>C</td>
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</tbody>
</table>

**Term hours subtotal:** 15

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*Page 2*
• Please see course lists below for CSE Technical Electives. Contact CIDSE Advising or visit the CIDSE website for additional information. Maximum 6 hours at the 300-level.

<table>
<thead>
<tr>
<th>Biology or Chemistry Courses</th>
<th>CSE Technical Electives</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 181: General Biology I (SQ)</td>
<td>Note: 6 hours maximum of 300-level Technical Electives, 6 hours minimum of 400-level Technical Electives.</td>
</tr>
<tr>
<td>BIO 182: General Biology II (SG)</td>
<td>Maximum 3 hours of CSE 484 or FSE 301.</td>
</tr>
<tr>
<td>CHM 113: General Chemistry I (SQ)</td>
<td>Maximum 6 hours of CSE 484, 492, 493 or 499.</td>
</tr>
<tr>
<td>CHM 114: General Chemistry for Engineers (SQ)</td>
<td>Some Technical Electives may require additional prerequisites.</td>
</tr>
<tr>
<td>CHM 116: General Chemistry II (SQ)</td>
<td>Students considering graduate program in Computer Science should take CSE 340 and CSE 355.</td>
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<thead>
<tr>
<th>4** Elective</th>
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Not from CSE 423 or 424.

<table>
<thead>
<tr>
<th>4** CSE Technical Elective</th>
<th>Term hours subtotal:</th>
<th>6</th>
<th>C</th>
<th>information. Maximum 6 hours at the 300-level.</th>
</tr>
</thead>
<tbody>
<tr>
<td>EEE 304: Signals and Systems II</td>
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<tr>
<td>EEE 350: Random Signal Analysis</td>
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<td>EEE 404: Real-Time DSP Systems</td>
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<tr>
<td>EEE 407: Digital Signal Processing</td>
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<tr>
<td>EEE 425: Digital Systems and Circuits</td>
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<tr>
<td>EEE 455: Communication Systems</td>
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<td>EEE 480: Feedback Systems</td>
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<tr>
<td>EEE 481: Computer-Controlled Systems</td>
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<tr>
<td>FSE 301: Entrepreneurship and Value Creation</td>
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</tbody>
</table>
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)

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 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 2019 - 2020 academic year.

IEE 385: Engineering Statistics: Probability
MAT 416: Introduction to Graph Theory
MAT 421: Applied Computational Methods (CS)
MAT 447: Cryptography I
MAT 448: Cryptography II
PHY 302: Mathematical Methods in Physics II
PHY 333: Electronic Circuits and Measurements
PHY 441: Statistical and Thermal Physics