## 2018 - 2019 Major Map

**Industrial Engineering, BSE**

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

### Term 1 - 0 - 15 Credit Hours

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAT 265: Calculus for Engineers I (MA)</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>ASU 101-IEE: The ASU Experience</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENG 101 or ENG 102: First-Year Composition OR</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>ENG 105: Advanced First-Year Composition OR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENG 107 or ENG 108: First-Year Composition OR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FSE 100: Introduction to Engineering</td>
<td>2</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>Basic Science Elective</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social-Behavioral Sciences (SB) AND Global Awareness (G)</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum 2.00 GPA ASU Cumulative.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Term hours subtotal: 15-16

- An SAT, ACT, Accuplacer, TOEFL or IELTS score determines placement into first-year composition courses.

- ASU Mathematics Placement Assessment score determines placement in mathematics course.

- ASU 101 or College specific equivalent First Year Seminar required of all students and should be taken in the first semester.

- Prep for success using the Freshman Guide.

- Join aFulton community.

- Exploreengineering and technical professions.

### Term 2 - 15 - 31 Credit Hours

<table>
<thead>
<tr>
<th>Course</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>
<td></td>
</tr>
<tr>
<td>MAT 266: Calculus for Engineers II (MA)</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>CHM 114: General Chemistry for Engineers (SQ) OR CHM 116: General Chemistry II (SQ)</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENG 101 or ENG 102: First-Year Composition OR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENG 105: Advanced First-Year Composition OR</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>ENG 107 or ENG 108: First-Year Composition OR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humanities, Arts and Design (HU) AND Historical Awareness (H)</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Complete ENG 101 OR ENG 105 OR ENG 107 course(s).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum 2.00 GPA ASU Cumulative.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Term hours subtotal: 16

- Students with credit for CHM 113 must take CHM 116.

- Create a Handshake profile.

- Get involved with EPICS, the Generator Labs, and the Fulton Start-Up Center.

- 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 3 - 31 - 46 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>IEE 210: Introduction to Industrial Engineering</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>MAT 267: Calculus for Engineers III (MA)</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>MSE 250: Structure and Properties of Materials</td>
<td>3</td>
<td></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>Complete Mathematics (MA) requirement.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum 2.00 GPA ASU Cumulative.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Term hours subtotal: 15
<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECN 211: Macroeconomic Principles (SB)</td>
<td>3</td>
<td>C</td>
<td>• Pursue an undergraduate research experience.</td>
</tr>
<tr>
<td>IEE 380: Probability and Statistics for Engineering Problem Solving (CS)</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 121: University Physics I: Mechanics (SQ)</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>PHY 122: University Physics Laboratory I (SQ)</td>
<td>1</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><strong>Term hours subtotal:</strong></td>
<td></td>
<td></td>
<td>16</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEE 300: Economic Analysis for Engineers</td>
<td>3</td>
<td>C</td>
<td>• Network at student organization competitions or professional societies.</td>
</tr>
<tr>
<td>MAE 201: Mechanics of Particles and Rigid Bodies I: Statics</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHY 131: University Physics II: Electricity and Magnetism (SQ)</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PHY 132: University Physics Laboratory II (SQ)</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MAT 242: Elementary Linear Algebra OR MAT 342: Linear Algebra OR MAT 343: Applied Linear Algebra</td>
<td>2-3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td><strong>Term hours subtotal:</strong></td>
<td></td>
<td></td>
<td>15-16</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEE 321: Ethics and Technical Communication</td>
<td>1</td>
<td>C</td>
<td>• Research and prepare for graduate school.</td>
</tr>
<tr>
<td>IEE 376: Operations Research Deterministic Techniques/Applications</td>
<td>3</td>
<td>C</td>
<td>• Apply for a Fulton Schools 4+1 program.</td>
</tr>
<tr>
<td>IEE 369: Work Analysis and Design (L)</td>
<td>3</td>
<td>C</td>
<td>• Develop a professional profile online.</td>
</tr>
<tr>
<td>Engineering Science Elective</td>
<td>3-4</td>
<td></td>
<td>• Effective fall 2019, IEE 376 also requires IEE 210 with a C better as a prerequisite.</td>
</tr>
<tr>
<td>Upper Division Career Focus Study Area</td>
<td>3</td>
<td>C</td>
<td></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></td>
</tr>
<tr>
<td><strong>Complete Cultural Diversity in the U.S. (C) AND Global Awareness (G) AND Historical Awareness (H) course(s).</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Term hours subtotal:</strong></td>
<td></td>
<td></td>
<td>16-17</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEE 485: Systems Design Capstone I (L)</td>
<td>3</td>
<td>C</td>
<td>• Plan for success using the Senior Guide.</td>
</tr>
<tr>
<td>IEE 470: Stochastic Operations Research</td>
<td>3</td>
<td>C</td>
<td>• Use Handshake to apply for full-time positions.</td>
</tr>
<tr>
<td>IEE 474: Quality Control</td>
<td>3</td>
<td>C</td>
<td>• Complete an in-person or virtual practice interview.</td>
</tr>
<tr>
<td>IEE 475: Simulating Stochastic Systems (CS)</td>
<td>3</td>
<td>C</td>
<td>• Effective spring 2019, IEE 485 also requires IEE 321 with a C or better as a prerequisite.</td>
</tr>
<tr>
<td>Upper Division Career Focus Study Area</td>
<td>3</td>
<td>C</td>
<td>• Effective fall 2019, IEE 485 will also require IEE 369 with a C or better as a prerequisite.</td>
</tr>
<tr>
<td><strong>Term hours subtotal:</strong></td>
<td></td>
<td></td>
<td>15</td>
</tr>
</tbody>
</table>
Select a minimum of nine semester hours from one of the following Career Focus Study Areas. Students will need to submit a Career Focus Proposal Form prior to taking classes. Please note that some of these courses may require additional prerequisites. All course options should be discussed with an advisor, as classes have prerequisites and are sequential.

- Visit the CIDSE website for additional information about Career Focus Study Area and Technical Elective courses.
- The curriculum updates referred to in some terms of the major map occurred because the Ira A. Fulton Engineering programs are required by our accreditation agency ABET to follow a curriculum continuous improvement process to keep up with technology changes and feedback from industry constituents. The changes were made to better prepare students for future success in the capstone courses for the degree.
ECN 306: Survey of International Economics (SB & G)
MGT 302: Principles of International Business (G)
MGT 459: International Management (G)

Career Focus Study Area (Industrial Statistics)
IEE 381: Lean Six Sigma Methodology
STP 425: Stochastic Processes
STP 429: Experimental Statistics (CS)

IEE 421: Urban Operations Research
IEE 426: Operations Research in Healthcare
IEE 431: Engineering Administration (L)

Career Focus Study Area (Operations Research)
IEE 421: Urban Operations Research
IEE 426: Operations Research in Healthcare
MAT 300: Mathematical Structures (L)

IEE Technical Electives (May not be duplicated with Career Focus Study Area requirement courses)
CSE 494: Data Mining
FSE 301: Entrepreneurship and Value Creation

IEE 381: Lean Six Sigma Methodology
IEE 412: Introduction to Financial Engineering
IEE 421: Urban Operations Research
IEE 426: Operations Research in Healthcare
IEE 431: Engineering Administration (L)
IEE 437: Human Factors Engineering
IEE 454: Risk Management
IEE 456: Introduction to Systems Engineering
IEE 458: Project Management
IEE 477: System Dynamics and Thinking
SCM 300: Global Supply Operations
Any 300-level or higher approved Engineering or Business course with Program Chair approval.

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

Note: Students must be admitted into the 4+1 Program. See your academic advisor for details.

Three graduate-level courses (IEE 5**) of which two or more are from the Master's Core Class list.
General Studies designations listed on the major map are current for the 2018 - 2019 academic year.