### 2018 - 2019 Major Map

**Mechanical Engineering (Energy and Environment), BSE**

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

#### Term 1 - 16 Credit Hours

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
</table>
| MAT 265: Calculus for Engineers I (MA)                                             | 3     | C             | An SAT, ACT, Accuplacer, IELTS, or TOEFL score determines placement into first-year composition courses.  
| ASU 101-MEE: The ASU Experience                                                   | 1     |               | ASU Mathematics Placement Assessment score determines placement in mathematics course.  
| CHM 114: General Chemistry for Engineers (SQ) OR CHM 116: General Chemistry II (SQ) | 4     | C             | ASU 101 or college-specific equivalent First-Year Seminar required of all freshman students.  
| ENG 101: First-Year Composition or ENG 102: First-Year Composition OR ENG 105: Advanced First-Year Composition OR ENG 107: First-Year Composition | 3     | C             | Complete CHM 114 OR CHM 116 course(s).  
| FSE 100: Introduction to Engineering                                               | 2     | C             | Create a Handshake profile.  
| Humanities, Arts and Design (HU) AND Cultural Diversity in the U.S. (C)            | 3     |               | Get involved with EPICS, the Generator Labs, and the Fulton Start-Up Center.  

**Minimum 2.00 GPA ASU Cumulative.**

**Term hours subtotal:** 16

#### Term 2 - 16 Credit Hours

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Hours</th>
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</tr>
</thead>
</table>
| ENG 101: First-Year Composition or ENG 102: First-Year Composition OR ENG 105: Advanced First-Year Composition OR ENG 107: First-Year Composition | 3     | C             | Pre for success using the Sophomore Guide.  
| MAT 242: Elementary Linear Algebra                                                 | 2     | C             | Join a Fulton community.  
| MAT 266: Calculus for Engineers II (MA)                                            | 3     | C             | Explore engineering and technical professions.  
| PHY 121: University Physics I: Mechanics (SQ)                                       | 3     | C             |  
| PHY 122: University Physics Laboratory I (SQ)                                       | 1     | C             |  
| MAE 215: Introduction to Programming in MATLAB                                      | 1     | C             |  
| Social-Behavioral Sciences (SB) AND Historical Awareness (H)                       | 3     |               |  
| Minimum 2.00 GPA ASU Cumulative.                                                   |       |               |  
| Complete CHM 114 OR CHM 116 course(s).                                             |       |               |  
| Complete ENG 101 OR ENG 105 OR ENG 107 course(s).                                  |       |               |  

**Term hours subtotal:** 16

#### Term 3 - 32 Credit Hours

<table>
<thead>
<tr>
<th>Course Description</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAT 267: Calculus for Engineers III (MA)</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
</tbody>
</table>

**Term hours subtotal:** 32

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**Page 1**
Course | Hours | Minimum Grade | Notes
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MAT 275: Modern Differential Equations (MA) | 3 | C |  
PHY 131: University Physics II: Electricity and Magnetism (SQ) | 3 | C |  
EEE 202: Circuits I | 4 | C |  
**Minimum 2.00 GPA ASU Cumulative.**
Complete Mathematics (MA) requirement.

**Term hours subtotal:** 16

### Term 4: 48 - 62 Credit Hours

#### Critical course signified by 🌟

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAE 202: Mechanics of Particles and Rigid Bodies II: Dynamics</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>MAE 213: Mechanics of Materials</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>MAE 241: Introduction to Thermodynamics</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>MAE 214: Computer-Aided Engineering I</td>
<td>1</td>
<td>C</td>
<td></td>
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<tr>
<td>MAE 384: Advanced Mathematical Methods for Engineers (CS)</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>
<td></td>
</tr>
</tbody>
</table>

**Term hours subtotal:** 14

### Term 5: 62 - 78 Credit Hours

#### Necessary course signified by 🌟

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEE 322: Structural Mechanics</td>
<td>4</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>CHM 231: Elementary Organic Chemistry (SQ) OR CHM 233: General Organic Chemistry I</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>MAE 242: Introduction to Fluid Mechanics</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>MAE 301: Applied Experimental Statistics</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>MSE 250: Structure and Properties of Materials</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
</tbody>
</table>

**Term hours subtotal:** 16

### Term 6: 78 - 93 Credit Hours

#### Necessary course signified by 🌟

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAE 318: System Dynamics and Control I</td>
<td>4</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>MEE 340: Heat Transfer</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>MAE 400: Engineering Profession (L)</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>MEE 323: Computer-Aided Engineering II</td>
<td>2</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>MEE 342: Principles of Mechanical Design</td>
<td>3</td>
<td>C</td>
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</tr>
</tbody>
</table>

Complete Cultural Diversity in the U.S. (C) AND Global Awareness (G) AND Historical Awareness (H) course(s).

**Term hours subtotal:** 15

### Term 7: 93 - 108 Credit Hours

#### Necessary course signified by 🌟

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEE 482: Intermediate Thermodynamics</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>MAE 417: System Dynamics and Control II</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>MEE 491: Experimental Mechanical Engineering (L)</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>Upper Division Energy and Environment Technical Elective</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>GCU 364: Energy in the Global Arena (SB &amp; G) OR PUP 190: Sustainable Cities ((HU or SB) &amp; G) OR SOS 171: The Thread of Energy (SB &amp; G) OR GPH 314: Global Change (HU &amp; G) OR HST 302: Energy Transitions and Sustainability ((HU or SB) &amp; G &amp; H)</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Term hours subtotal:** 15

- 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.
- **Pursue an undergraduate research experience.**
- **Apply for internships.**
- **Attend career fairs and events.**
- **Plan for success using the Junior Guide.**
- **Network at student organization competitions or professional societies.**
- **Research and prepare for graduate school.**
- **Apply for an engineering 4+1 program.**
- **Develop a professional profile online.**
- **For additional information about Upper Division Energy and Environment Technical Electives, please see:** Upper Division Energy and Environment Technical Electives
- **Plan for success using the Senior Guide.**
- **Apply for full-time positions.**
- **Complete an in-person or practice interview.**
<table>
<thead>
<tr>
<th>MEE 446: Energy Systems Design</th>
<th>3</th>
<th>C</th>
</tr>
</thead>
</table>

Upper Division Technical Elective

| GCU 364: Energy in the Global Arena (SB & G) OR PUP 190: Sustainable Cities ((H/U or SB) & G) OR SOS 171: The Thread of Energy (SB & G) OR GPH 314: Global Change (H/U & G) OR HST 302: Energy Transitions and Sustainability ((H/U or SB) & G & H) | 3 |

Upper Division Humanities, Arts and Design (HU) OR Upper Division Social-Behavioral Sciences (SB)

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Term hours subtotal: 12

*For additional information about Upper Division Energy and Environment Technical Electives & Upper Division Technical Electives, please go to: Upper Division Energy and Environment Technical Electives & Upper Division Technical Electives

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For additional information about Upper Division Technical Electives, please go to:

Upper Division Technical Electives
MEE 440: Renewable Energy: Mechanical Systems
MEE 441: Wind Energy
MSE 460: Nanomaterials in Energy Production and Storage
MSE 494: Electrochemical Energy Storage and Conversion
By approval only:
MAE 484: Internship
MAE 492: Honors Directed Study
MAE 493: Honors Thesis (L)
MAE 498: Pro-Seminar or MAE 499: Individualized Instruction

*Students who do not meet the enrollment requirements for these courses may be allowed to enroll with instructor consent. Courses not listed here require a department petition form. To take any 494 class, please check with your advisor first. A max of 3 credits from MAE 484/498/499 can be applied toward the TE requirements.
MSE 450: Introduction to Materials Characterization

MSE 460: Nanomaterials in Energy Production and Storage

MSE 476: Growth and Processing of Semiconductors


PHY 310: Classical Particles, Fields, and Matter I

PHY 361: Introductory Modern Physics

SES 311: Essentials of Astrobiology: Exploration for Life in the Universe

SES 350: Engineering Systems and Experimental Problem Solving

By approval only:

MAE 484: Internship

MAE 492: Honors Directed Study

MAE 493: Honors Thesis (L)

MAE 498: Pro-Seminar or MAE 499: Individualized Instruction

*Students who do not meet the enrollment requirements for these courses may be allowed to enroll with instructor consent. Courses not listed here require a department petition form. To take any 494 class, please check with your advisor first. A max of 3 credits from MAE 484/498/499 can be applied toward the TE requirements.

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.