## 2018 - 2019 Major Map
### Aerospace Engineering (Astronautics), BSE

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

### Term 1 - 16 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>ENG 101: First-Year Composition or ENG 102: First-Year Composition OR</td>
<td></td>
<td></td>
<td>• An SAT, ACT, Accuplacer, IELTS, or TOEFL score determines placement into first-year composition courses.</td>
</tr>
<tr>
<td>ENG 105: Advanced First-Year Composition OR</td>
<td></td>
<td></td>
<td>• Mathematics Placement Assessment score determines placement in mathematics course.</td>
</tr>
<tr>
<td>ENG 107: First-Year Composition or ENG 108: First-Year Composition</td>
<td>3</td>
<td>C</td>
<td>• ASU 101 or college-specific equivalent First-Year Seminar required of all freshman students.</td>
</tr>
<tr>
<td>MAT 265: Calculus for Engineers I (MA)</td>
<td>3</td>
<td>C</td>
<td>• ASU 101-AEE and FSE 100 required for freshmen and should be completed first semester.</td>
</tr>
<tr>
<td>ASU 101-AEE: The ASU Experience</td>
<td>1</td>
<td></td>
<td>• If ENG 105 taken, a 3 hr applicable elective must also be taken prior to graduation. See advisor.</td>
</tr>
<tr>
<td>CHM 114: General Chemistry for Engineers (SQ) OR CHM 116: General</td>
<td>4</td>
<td>C</td>
<td>• Prep for success using the Freshman Guide.</td>
</tr>
<tr>
<td>Chemistry II (SQ)</td>
<td></td>
<td></td>
<td>• Join a Fulton community.</td>
</tr>
<tr>
<td>FSE 100: Introduction to Engineering OR SES 100: Introduction to</td>
<td>2-3</td>
<td>C</td>
<td>• Explore engineering and technical professions.</td>
</tr>
<tr>
<td>Exploration (CS)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humanities, Arts and Design (HU) AND Cultural Diversity in the U.S.</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(C)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum 2.00 GPA ASU Cumulative.</td>
<td></td>
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</table>

**Term hours subtotal:** 16-17

### Term 2 - 16 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>ENG 101: First-Year Composition or ENG 102: First-Year Composition OR</td>
<td></td>
<td></td>
<td>• Create a Handshake profile.</td>
</tr>
<tr>
<td>ENG 105: Advanced First-Year Composition OR</td>
<td></td>
<td></td>
<td>• Get involved with EPICS, the Generator Labs, and the Fulton Start-Up Center.</td>
</tr>
<tr>
<td>ENG 107: First-Year Composition or ENG 108: First-Year Composition</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>MAT 264: Calculus for Engineers II (MA)</td>
<td>3</td>
<td>C</td>
<td></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>MAE 215: Introduction to Programming in MATLAB</td>
<td>1</td>
<td>C</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>Complete CHM 114 OR CHM 116 course(s).</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Minimum 2.00 GPA ASU Cumulative.</td>
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**Term hours subtotal:** 16

### Term 3 - 48 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 201: Mechanics of Particles and Rigid Bodies I: Statics</td>
<td>3</td>
<td>C</td>
<td>• Prep for success using the Sophomore Guide.</td>
</tr>
<tr>
<td>MAT 267: Calculus for Engineers III (MA)</td>
<td>3</td>
<td>C</td>
<td>• Consult the Resume, Presentation, and Resource Library for tips on how to create a</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Hours</td>
<td>Grade</td>
</tr>
<tr>
<td>-------------</td>
<td>--------------------------------------------------</td>
<td>-------</td>
<td>-------</td>
</tr>
<tr>
<td>MAT 275</td>
<td>Modern Differential Equations (MA)</td>
<td>3</td>
<td>C</td>
</tr>
<tr>
<td>PHY 131</td>
<td>University Physics II: Electricity and Magnetism (SQ)</td>
<td>3</td>
<td>C</td>
</tr>
<tr>
<td>EEE 202</td>
<td>Circuits I</td>
<td>4</td>
<td>C</td>
</tr>
<tr>
<td>Term</td>
<td>Hours subtotal:</td>
<td>16</td>
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**Term 4 48 - 62 Credit Hours Critical course signified by ♦**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
<th>Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAE 202</td>
<td>Mechanics of Particles and Rigid Bodies II: Dynamics</td>
<td>3</td>
<td>C</td>
<td>• Pursue an undergraduate research experience.</td>
</tr>
<tr>
<td>MAE 213</td>
<td>Mechanics of Materials</td>
<td>3</td>
<td>C</td>
<td>• Apply for internships.</td>
</tr>
<tr>
<td>MAE 242</td>
<td>Introduction to Fluid Mechanics</td>
<td>3</td>
<td>C</td>
<td>• Attend career fairs and events.</td>
</tr>
<tr>
<td>MAE 214</td>
<td>Computer-Aided Engineering I</td>
<td>1</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>MAE 384</td>
<td>Advanced Mathematical Methods for Engineers (CS)</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>PHY 132</td>
<td>University Physics Laboratory II (SQ)</td>
<td>1</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>Term</td>
<td>Hours subtotal:</td>
<td>14</td>
<td></td>
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</table>

**Term 5 62 - 79 Credit Hours Necessary course signified by ★**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
<th>Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>AEE 360</td>
<td>Aerodynamics (L)</td>
<td>4</td>
<td>C</td>
<td>• Both AEE 360 and AEE 362 must be taken to secure Literacy and Critical Inquiry (L) General Studies credit.</td>
</tr>
<tr>
<td>EEE 203</td>
<td>Signals and Systems I</td>
<td>3</td>
<td>C</td>
<td>• Plan for success using the Junior Guide.</td>
</tr>
<tr>
<td>MAE 241</td>
<td>Introduction to Thermodynamics</td>
<td>3</td>
<td>C</td>
<td>• Network at student organization competitions or professional societies.</td>
</tr>
<tr>
<td>MAE 301</td>
<td>Applied Experimental Statistics</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>MAE 318</td>
<td>System Dynamics and Control I</td>
<td>4</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>Term</td>
<td>Hours subtotal:</td>
<td>17</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Term 6 79 - 93 Credit Hours Necessary course signified by ★**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
<th>Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>AEE 462</td>
<td>Space Vehicle Dynamics and Control</td>
<td>3</td>
<td>C</td>
<td>• Both AEE 362 and AEE 360 must be taken to secure Literacy and Critical Inquiry (L) General Studies credit.</td>
</tr>
<tr>
<td>AEE 325</td>
<td>Aerospace Structures and Materials</td>
<td>4</td>
<td>C</td>
<td>• Research and prepare for graduate school.</td>
</tr>
<tr>
<td>AEE 362</td>
<td>High-Speed Aerodynamics (L)</td>
<td>4</td>
<td>C</td>
<td>• Apply for an engineering 4+1 program.</td>
</tr>
<tr>
<td>EEE 350</td>
<td>Random Signal Analysis</td>
<td>3</td>
<td>C</td>
<td>• Develop a professional profile online.</td>
</tr>
<tr>
<td>Complete</td>
<td>Cultural Diversity in the U.S. (C) AND Global</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Awareness (G) AND Historical Awareness (H) course(s).</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Term</td>
<td>Hours subtotal:</td>
<td>14</td>
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<td></td>
</tr>
</tbody>
</table>

**Term 7 93 - 108 Credit Hours Necessary course signified by ★**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
<th>Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>AEE 445</td>
<td>Fundamentals of Spacecraft Design</td>
<td>3</td>
<td>C</td>
<td>• Plan for success using the Senior Guide.</td>
</tr>
<tr>
<td>AEE 465</td>
<td>Rocket Propulsion</td>
<td>3</td>
<td>C</td>
<td>• Use Handshake to apply for full-time positions.</td>
</tr>
<tr>
<td>MAE 400</td>
<td>Engineering Profession (L)</td>
<td>3</td>
<td>C</td>
<td>• Complete an in-person or virtual practice interview.</td>
</tr>
<tr>
<td>Upper Division EEE Technical Elective</td>
<td>3</td>
<td>C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humanities, Arts and Design (HU)</td>
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<tr>
<td>Term</td>
<td>Hours subtotal:</td>
<td>15</td>
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**Term 8 108 - 120 Credit Hours Necessary course signified by ★**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
<th>Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>AEE 480</td>
<td>Space Systems Design</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>Upper Division Technical Elective</td>
<td>3</td>
<td>C</td>
<td></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>
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<tr>
<td>----------------------------------------------------------</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social-Behavioral Sciences (SB) AND Historical Awareness (H)</td>
<td>3</td>
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</tbody>
</table>

Term hours subtotal: 12

- For more information about Upper Division Technical Elective options, please visit: Upper Division Technical Electives

### Upper Division EEE Technical Elective

<table>
<thead>
<tr>
<th>Upper Division EEE Technical Elective</th>
<th>Upper Division Technical Elective</th>
</tr>
</thead>
<tbody>
<tr>
<td>EEE 455: Communication Systems</td>
<td>AEE 313: Aircraft Dynamics and Control</td>
</tr>
<tr>
<td>EEE 459: Communication Networks</td>
<td>AEE 344: Fundamentals of Aircraft Design</td>
</tr>
<tr>
<td></td>
<td>AEE 415: Vibration Analysis</td>
</tr>
<tr>
<td></td>
<td>AEE 426: Design of Aerospace Structures</td>
</tr>
<tr>
<td></td>
<td>AEE 463: Aircraft Propulsion</td>
</tr>
<tr>
<td></td>
<td>AEE 466: Rotary Wing Aerodynamics and Performance</td>
</tr>
<tr>
<td></td>
<td>AEE 471: Computational Fluid Dynamics</td>
</tr>
<tr>
<td></td>
<td>AST 321: Introduction to Planetary and Stellar Astrophysics (SQ)</td>
</tr>
<tr>
<td></td>
<td>AST 322: Introduction to Galactic and Extragalactic Astrophysics (SQ)</td>
</tr>
<tr>
<td></td>
<td>CEE 440: Hydrology</td>
</tr>
<tr>
<td></td>
<td>CHM 325: Analytical Chemistry</td>
</tr>
<tr>
<td></td>
<td>EEE 304: Signals and Systems II</td>
</tr>
<tr>
<td></td>
<td>EEE 333: Hardware Design Languages and Programmable Logic</td>
</tr>
<tr>
<td></td>
<td>EEE 334: Circuits II</td>
</tr>
<tr>
<td></td>
<td>EEE 480: Feedback Systems</td>
</tr>
<tr>
<td></td>
<td>EEE 481: Computer-Controlled Systems</td>
</tr>
<tr>
<td></td>
<td>EGR 433: Transforms and Systems Modeling</td>
</tr>
<tr>
<td></td>
<td>FSE 301: Entrepreneurship and Value Creation</td>
</tr>
<tr>
<td></td>
<td>GLG 404: Fundamentals of Planetary Geology</td>
</tr>
<tr>
<td></td>
<td>IEE 300: Economic Analysis for Engineers</td>
</tr>
<tr>
<td></td>
<td>MAE 341: Mechanism Analysis and Design</td>
</tr>
<tr>
<td></td>
<td>MAE 404: Finite Elements in Engineering</td>
</tr>
<tr>
<td></td>
<td>MAE 417: System Dynamics and Control II</td>
</tr>
<tr>
<td></td>
<td>MAE 436: Combustion</td>
</tr>
</tbody>
</table>

- For more information about Technical Electives, please visit: Upper Division Technical Electives
MAE 455: Polymers and Composites
MAT 300: Mathematical Structures (L)
MAT 362: Advanced Mathematics for Engineers and Scientists
MAT 371: Advanced Calculus I
MAT 420: Scientific Computing
MAT 421: Applied Computational Methods (CS)
MAT 423: Numerical Analysis I (CS)
MAT 425: Numerical Analysis II (CS)
MAT 451: Mathematical Modeling (CS)
MEE 323: Computer-Aided Engineering II
MEE 340: Heat Transfer
MEE 351: Manufacturing Processes
MEE 434: Internal Combustion Engines
MEE 440: Renewable Energy: Mechanical Systems
MEE 441: Wind Energy
MEE 472: Intermediate Fluid Mechanics
MEE 482: Intermediate Thermodynamics
MSE 330: Thermodynamics of Materials
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
SES 405: Exploration Systems Engineering
SES 410: Senior Exploration Project I

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.

**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.

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Hours</td>
<td>120</td>
</tr>
<tr>
<td>Upper Division Hours</td>
<td>45 minimum</td>
</tr>
<tr>
<td>Major GPA</td>
<td>2.00 minimum</td>
</tr>
<tr>
<td>Cumulative GPA</td>
<td>2.00 minimum</td>
</tr>
<tr>
<td>Total hrs at ASU</td>
<td>30 minimum</td>
</tr>
<tr>
<td>Hrs Resident Credit for Academic Recognition</td>
<td>56 minimum</td>
</tr>
<tr>
<td>Total Community College Hrs</td>
<td>64 maximum</td>
</tr>
</tbody>
</table>