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

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

### Term 1 0 - 16 Credit Hours

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</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             | • An SAT, ACT, Accuplacer, IELTS, or TOEFL 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.  
• ASU 101-AEE and FSE 100 required for freshmen and should be completed first semester.  
• If ENG 105 taken, a 3 hr applicable elective must also be taken prior to graduation. See advisor.  
• Prep for success using the Freshman Guide.  
• Join a Fulton community.  
• Explore engineering and technical professions. |
| MAT 265     | Calculus for Engineers I (MA)                    | 3     | C             |                                                                      |
| ASU 101-AEE | The ASU Experience                               | 1     |               |                                                                      |
| CHM 114     | General Chemistry for Engineers (SQ) OR CHM 116: General Chemistry II (SQ) | 4     | C             |                                                                      |
| FSE 100     | Introduction to Engineering OR SES 100: Introduction to Exploration (CS) | 2-3   | C             |                                                                      |
| Humanities, Arts and Design (HU) AND Cultural Diversity in the U.S. (C) | 3     |               |                                                                      |
| Minimum 2.00 GPA ASU Cumulative. | | | | |

**Term hours subtotal:** 16-17

### Term 2 16 - 32 Credit Hours

<table>
<thead>
<tr>
<th>Course Code</th>
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<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</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             | • Create a Handshake profile.  
• Get involved with EPICS, the Generator Labs, and the Fulton Start-Up Center. |
| MAT 242     | Elementary Linear Algebra                         | 2     |               |                                                                      |
| MAT 266     | Calculus for Engineers II (MA)                    | 3     | C             |                                                                      |
| 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 Global Awareness (G) | 3     |               |                                                                      |
| Complete CHM 114 OR CHM 116 course(s). | | | | |
| Minimum 2.00 GPA ASU Cumulative. | | | | |

**Term hours subtotal:** 16

### Term 3 32 - 48 Credit Hours

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG 101</td>
<td>First-Year Composition or ENG 102: First-Year Composition OR ENG 105: Advanced First-Year Composition OR ENG 107: First-Year Composition</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>MAT 242</td>
<td>Elementary Linear Algebra</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MAT 266</td>
<td>Calculus for Engineers II (MA)</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>PHY 121</td>
<td>University Physics I: Mechanics (SQ)</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>PHY 122</td>
<td>University Physics Laboratory I (SQ)</td>
<td>1</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>MAE 215</td>
<td>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>
<td></td>
</tr>
<tr>
<td>Complete CHM 114 OR CHM 116 course(s).</td>
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<tr>
<td>Minimum 2.00 GPA ASU Cumulative.</td>
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</tbody>
</table>

**Term hours subtotal:** 16
MAE 201: Mechanics of Particles and Rigid Bodies I: Statics 3 C
MAT 267: Calculus for Engineers III (MA) 3 C
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 1

<table>
<thead>
<tr>
<th>Hours</th>
<th>Minimum Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAE 202: Mechanics of Particles and Rigid Bodies II: Dynamics</td>
<td>3 C</td>
</tr>
<tr>
<td>MAE 213: Mechanics of Materials</td>
<td>3 C</td>
</tr>
<tr>
<td>MAE 242: Introduction to Fluid Mechanics</td>
<td>3 C</td>
</tr>
<tr>
<td>MAE 214: Computer-Aided Engineering I</td>
<td>1 C</td>
</tr>
<tr>
<td>MAE 384: Advanced Mathematical Methods for Engineers (CS)</td>
<td>3 C</td>
</tr>
<tr>
<td>PHY 132: University Physics Laboratory II (SQ)</td>
<td>1 C</td>
</tr>
</tbody>
</table>

Term hours subtotal: 14

Term 5 62 - 79 Credit Hours

Necessary course signified by ★

<table>
<thead>
<tr>
<th>Hours</th>
<th>Minimum Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>AEE 360: Aerodynamics (L)</td>
<td>4 C</td>
</tr>
<tr>
<td>EEE 203: Signals and Systems I</td>
<td>3 C</td>
</tr>
<tr>
<td>MAE 241: Introduction to Thermodynamics</td>
<td>3 C</td>
</tr>
<tr>
<td>MAE 301: Applied Experimental Statistics</td>
<td>3 C</td>
</tr>
<tr>
<td>MAE 318: System Dynamics and Control I</td>
<td>4 C</td>
</tr>
</tbody>
</table>

Term hours subtotal: 17

Term 6 79 - 93 Credit Hours

Necessary course signified by ★

<table>
<thead>
<tr>
<th>Hours</th>
<th>Minimum Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>AEE 462: Space Vehicle Dynamics and Control</td>
<td>3 C</td>
</tr>
<tr>
<td>AEE 325: Aerospace Structures and Materials</td>
<td>4 C</td>
</tr>
<tr>
<td>AEE 362: High-Speed Aerodynamics (L)</td>
<td>4 C</td>
</tr>
<tr>
<td>EEE 350: Random Signal Analysis</td>
<td>3 C</td>
</tr>
</tbody>
</table>

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

Term hours subtotal: 14

Term 7 93 - 108 Credit Hours

Necessary course signified by ★

<table>
<thead>
<tr>
<th>Hours</th>
<th>Minimum Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>AEE 445: Fundamentals of Spacecraft Design</td>
<td>3 C</td>
</tr>
<tr>
<td>AEE 465: Rocket Propulsion</td>
<td>3 C</td>
</tr>
<tr>
<td>MAE 400: Engineering Profession (L)</td>
<td>3 C</td>
</tr>
<tr>
<td>Upper Division EEE Technical Elective</td>
<td>3 C</td>
</tr>
</tbody>
</table>

Humanities, Arts and Design (HU)

Term hours subtotal: 15

Term 8 108 - 120 Credit Hours

Necessary course signified by ★

<table>
<thead>
<tr>
<th>Hours</th>
<th>Minimum Grade</th>
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</thead>
<tbody>
<tr>
<td>AEE 480: Space Systems Design</td>
<td>3 C</td>
</tr>
</tbody>
</table>

Upper Division Technical Elective

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

Notes:
• 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.
• Create a technical resume.

• Pursue an undergraduate research experience.
• Apply for internships.
• Attend career fairs and events.

• Both AEE 360 and AEE 362 must be taken to secure Literacy and Critical Inquiry (L) General Studies credit.
• Plan for success using the Junior Guide.
• Network at student organization competitions or professional societies.

• Both AEE 362 and AEE 360 must be taken to secure Literacy and Critical Inquiry (L) General Studies credit.
• Research and prepare for graduate school.
• Apply for an engineering 4+1 program.
• Develop a professional profile online.

• Plan for success using the Senior Guide.
• Use Handshake to apply for full-time positions.
• Complete an in-person or virtual practice interview.

Term hours subtotal: 16

Term hours subtotal: 14

Term hours subtotal: 17

Term hours subtotal: 14

Term hours subtotal: 15

Term hours subtotal: 15
- For more information about Upper Division Technical Elective options, please visit: Upper Division Technical Electives

<table>
<thead>
<tr>
<th>Upper Division EEE Technical Elective</th>
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</thead>
<tbody>
<tr>
<td>EEE 455: Communication Systems</td>
<td>AEE 313: Aircraft Dynamics and Control</td>
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<tr>
<td>EEE 459: Communication Networks</td>
<td>AEE 344: Fundamentals of Aircraft Design</td>
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<td>AEE 415: Vibration Analysis</td>
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<td>AEE 426: Design of Aerospace Structures</td>
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<td>AEE 463: Aircraft Propulsion</td>
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<td>AEE 466: Rotary Wing Aerodynamics and Performance</td>
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<td>AEE 471: Computational Fluid Dynamics</td>
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<td>AST 321: Introduction to Planetary and Stellar Astrophysics (SQ)</td>
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<tr>
<td></td>
<td>AST 322: Introduction to Galactic and Extragalactic Astrophysics (SQ)</td>
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<td>CEE 440: Hydrology</td>
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<td>CHM 325: Analytical Chemistry</td>
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<td>EEE 304: Signals and Systems II</td>
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<td>EEE 333: Hardware Design Languages and Programmable Logic</td>
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<td>EEE 334: Circuits II</td>
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<td>EEE 480: Feedback Systems</td>
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<td>EEE 481: Computer-Controlled Systems</td>
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<td>EGR 433: Transforms and Systems Modeling</td>
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<td>FSE 301: Entrepreneurship and Value Creation</td>
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<td>GLG 404: Fundamentals of Planetary Geology</td>
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<td></td>
<td>IEE 300: Economic Analysis for Engineers</td>
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<td>MAE 341: Mechanism Analysis and Design</td>
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<td>MAE 404: Finite Elements in Engineering</td>
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<td>MAE 417: System Dynamics and Control II</td>
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<td>MAE 436: Combustion</td>
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<td>MAE 455: Polymers and Composites</td>
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<tr>
<td>Course Code</td>
<td>Course Title</td>
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<tr>
<td>MAT 300</td>
<td>Mathematical Structures (L)</td>
</tr>
<tr>
<td>MAT 362</td>
<td>Advanced Mathematics for Engineers and Scientists</td>
</tr>
<tr>
<td>MAT 371</td>
<td>Advanced Calculus I</td>
</tr>
<tr>
<td>MAT 420</td>
<td>Scientific Computing</td>
</tr>
<tr>
<td>MAT 421</td>
<td>Applied Computational Methods (CS)</td>
</tr>
<tr>
<td>MAT 423</td>
<td>Numerical Analysis I (CS)</td>
</tr>
<tr>
<td>MAT 425</td>
<td>Numerical Analysis II (CS)</td>
</tr>
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<td>MAT 451</td>
<td>Mathematical Modeling (CS)</td>
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<tr>
<td>MEE 323</td>
<td>Computer-Aided Engineering II</td>
</tr>
<tr>
<td>MEE 340</td>
<td>Heat Transfer</td>
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<tr>
<td>MEE 351</td>
<td>Manufacturing Processes</td>
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<tr>
<td>MEE 341</td>
<td>Internal Combustion Engines</td>
</tr>
<tr>
<td>MEE 440</td>
<td>Renewable Energy: Mechanical Systems</td>
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<tr>
<td>MEE 441</td>
<td>Wind Energy</td>
</tr>
<tr>
<td>MEE 472</td>
<td>Intermediate Fluid Mechanics</td>
</tr>
<tr>
<td>MEE 482</td>
<td>Intermediate Thermodynamics</td>
</tr>
<tr>
<td>MSE 330</td>
<td>Thermodynamics of Materials</td>
</tr>
<tr>
<td>PHY 310</td>
<td>Classical Particles, Fields, and Matter I</td>
</tr>
<tr>
<td>PHY 361</td>
<td>Introductory Modern Physics</td>
</tr>
<tr>
<td>SES 311</td>
<td>Essentials of Astrobiology: Exploration for Life in the Universe</td>
</tr>
<tr>
<td>SES 350</td>
<td>Engineering Systems and Experimental Problem Solving</td>
</tr>
<tr>
<td>SES 405</td>
<td>Exploration Systems Engineering</td>
</tr>
<tr>
<td>SES 410</td>
<td>Senior Exploration Project I</td>
</tr>
<tr>
<td>MAE 484</td>
<td>Internship</td>
</tr>
<tr>
<td>MAE 492</td>
<td>Honors Directed Study</td>
</tr>
<tr>
<td>MAE 493</td>
<td>Honors Thesis (L)</td>
</tr>
<tr>
<td>MAE 498</td>
<td>Pro-Seminar or MAE 499: Individualized Instruction</td>
</tr>
</tbody>
</table>

*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)

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 2018 - 2019 academic year.