# 2019 - 2020 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</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-AEE: The ASU Experience</td>
<td>1</td>
<td></td>
<td></td>
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<tr>
<td>CHM 114: General Chemistry for Engineers (SQ)</td>
<td>4</td>
<td>C</td>
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<tr>
<td>OR CHM 116: General Chemistry II (SQ)</td>
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<tr>
<td>ENG 101: First-Year Composition OR ENG 102: First-Year Composition OR ENG 107: First-Year Composition OR ENG 108: First-Year Composition</td>
<td>3</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>FSE 100: Introduction to Engineering OR SES 100: Introduction to Exploration (CS)</td>
<td>2-3</td>
<td>C</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>
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</tbody>
</table>

Minimum 2.00 GPA ASU Cumulative.

Term hours subtotal: 16-17

### Term 2 - 16 - 32 Credit Hours

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG 101 OR ENG 102: First-Year Composition OR ENG 105: Advanced First-Year Composition OR 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 266: 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>
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</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>
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</tbody>
</table>

Minimum 2.00 GPA ASU Cumulative.

Complete ENG 101 OR ENG 105 OR ENG 107 course(s).

Term hours subtotal: 16

### Term 3 - 32 - 46 Credit Hours

<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></td>
</tr>
<tr>
<td>MAT 267: Calculus for Engineers III (MA)</td>
<td>3</td>
<td>C</td>
<td></td>
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<tr>
<td>MAT 275: Modern Differential Equations (MA)</td>
<td>3</td>
<td>C</td>
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</tbody>
</table>

Minimum 2.00 GPA ASU Cumulative.

Complete required courses.

Term hours subtotal: 32-46

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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.

Prepare for success using the Freshman Guide.

Join a Fulton community.

Explore engineering and technical professions.

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
PHY 131: University Physics II: Electricity and Magnetism (SQ) 3 C  
MAE 214: Computer-Aided Engineering I 1 C  
PHY 132: University Physics Laboratory II (SQ) 1 C

Complete CHM 114 OR CHM 116 course(s).
Minimum 2.00 GPA ASU Cumulative.
Complete Mathematics (MA) requirement.

<table>
<thead>
<tr>
<th>Term 46 - 62 Credit Hours</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
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</thead>
</table>
| MAE 202: Mechanics of Particles and Rigid Bodies II: Dynamics | 3 | C | • Pursue an undergraduate research experience.  
| MAE 213: Mechanics of Materials | 3 | C | • Apply for internships.  
| MAE 242: Introduction to Fluid Mechanics | 3 | C | • Attend career fairs and events.  
| EEE 202: Circuits I | 4 | C |
| MAE 384: Advanced Mathematical Methods for Engineers (CS) | 3 | C |

Term hours subtotal: 16

<table>
<thead>
<tr>
<th>Term 52 - 79 Credit Hours</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
</tr>
</thead>
</table>
| AEE 360: Aerodynamics (L) | 4 | C | • Both AEE 360 and AEE 362 must be taken to secure Literacy and Critical Inquiry (L) General Studies credit.  
| EEE 203: Signals and Systems I | 3 | C | • Plan for success using the Junior Guide.  
| MAE 241: Introduction to Thermodynamics | 3 | C | • Network at student organization competitions or professional societies.  
| MAE 301: Applied Experimental Statistics | 3 | C |
| MAE 318: System Dynamics and Control I | 4 | C |

Term hours subtotal: 17

<table>
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<tr>
<th>Term 62 - 79 Credit Hours</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
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</table>
| AEE 462: Space Vehicle Dynamics and Control | 3 | C | • Both AEE 362 and AEE 360 must be taken to secure Literacy and Critical Inquiry (L) General Studies credit.  
| AEE 325: Aerospace Structures and Materials | 4 | C | • Research and prepare for graduate school.  
| AEE 362: High-Speed Aerodynamics (L) | 4 | C | • Apply for an engineering 4+1 program.  
| EEE 350: Random Signal Analysis | 3 | C | • Develop a professional profile online.  

Term hours subtotal: 14

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<tr>
<th>Term 79 - 108 Credit Hours</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
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</table>
| AEE 465: Rocket Propulsion | 3 | C | • Use Handshake to apply for full-time positions.  
| MAE 400: Engineering Profession (L) | 3 | C | • Complete an in-person or virtual practice interview.  
| Upper Division EEE Technical Elective | 3 | C |
| Social-Behavioral Sciences (SB) AND Historical Awareness (H) | 3 |

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

Term hours subtotal: 15

<table>
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<tr>
<th>Term 80 - 120 Credit Hours</th>
<th>Hours</th>
<th>Minimum Grade</th>
<th>Notes</th>
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<tbody>
<tr>
<td>AEE 480: Space Systems Design</td>
<td>3</td>
<td>C</td>
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<tr>
<td>Upper Division Technical Elective</td>
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<tr>
<td>Upper Division EEE Technical Elective</td>
<td>Upper Division Technical Elective</td>
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<tr>
<td>EEE 455: Communication Systems</td>
<td>AEE 313: Aircraft Dynamics and Control</td>
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<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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<td>AST 322: Introduction to Galactic and Extragalactic Astrophysics (SQ)</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 407: Digital Signal Processing</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 317: Humanitarian Engineering Project II</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>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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- For more information about Upper Division Technical Elective options, please visit: Upper Division Technical Electives

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Humanities, Arts and Design (HU) 3

<table>
<thead>
<tr>
<th>Humanities, Arts and Design (HU)</th>
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<tbody>
<tr>
<td>OR</td>
<td>OR</td>
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<tr>
<td>Upper Division Social-Behavioral Sciences (SB)</td>
<td>Upper Division Social-Behavioral Sciences (SB)</td>
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<tr>
<td>Term hours subtotal: 12</td>
<td>Term hours subtotal: 12</td>
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For more information about Upper Division Technical Elective options, please visit: Upper Division Technical Electives
MAE 417: System Dynamics and Control II
MAE 436: Combustion
MAE 455: Polymers and Composites
MAT 300: Mathematical Structures (L)
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
SES 494: Modeling and Analysis of Space Thermal Systems
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
General Studies designations listed on the major map are current for the 2019 - 2020 academic year.

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.

*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.