















2023 - 2024 Major Map

Aerospace Engineering (Aeronautics), **BSE**

School/College: Ira A. Fulton Schools of Engineering
ESAEROBSE

Term 1 0 - 16 Credit Hours Critical course signified by 	Hours	Minimum Grade	Notes
 MAT 265: Calculus for Engineers I (MA)	3	C	<ul style="list-style-type: none"> ASU 101 or college-specific equivalent First-Year Seminar required of all first-year students. FSE 100 required for first-year students and should be completed in the first semester. Non-first-year students: see advisor for petitioning replacement electives. If ENG 105 is taken, a three hour applicable elective must also be taken prior to graduation. See advisor. Prep for success using the First-Year Student Guide. Join a Fulton community. Explore engineering and technical professions.
ASU 101-AEE: The ASU Experience	1		
CHM 114: General Chemistry for Engineers (SQ) OR CHM 116: General Chemistry II (SQ)	4	C	
ENG 101: First-Year Composition 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	3	C	
FSE 100: Introduction to Engineering	2	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		

Term 2 16 - 32 Credit Hours Critical course signified by 	Hours	Minimum Grade	Notes
 MAT 242: Elementary Linear Algebra	2	C	<ul style="list-style-type: none"> Create a Handshake profile. Get involved with EPICS, the Generator Labs, and the Fulton Start-Up Center.
 MAT 266: Calculus for Engineers II (MA)	3	C	
 PHY 121: University Physics I: Mechanics (SQ)	3	C	
ENG 101: First-Year Composition 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	3	C	
MAE 215: Introduction to Programming in MATLAB	1	C	
PHY 122: University Physics Laboratory I (SQ)	1	C	
Social-Behavioral Sciences (SB) AND Historical Awareness (H)	3		
 Complete ENG 101 OR ENG 105 OR ENG 107 course(s).			
 Minimum 2.00 GPA ASU Cumulative.			
Term hours subtotal:	16		

Term 3 32 - 46 Credit Hours Critical course signified by 	Hours	Minimum Grade	Notes
 MAE 201: Mechanics of Particles and Rigid Bodies I: Statics	3	C	<ul style="list-style-type: none"> Prep for success using the Sophomore Guide.
 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	
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).		
❖ Complete First-Year Composition requirement.		
❖ Minimum 2.00 GPA ASU Cumulative.		
Complete Mathematics (MA) requirement.		
Term hours subtotal:	14	

Term 4 46 - 62 Credit Hours Critical course signified by ❖	Hours	Minimum Grade	Notes
❖ MAE 202: Mechanics of Particles and Rigid Bodies II: Dynamics	3	C	<ul style="list-style-type: none"> Pursue an undergraduate research experience. Apply for internships. Attend career fairs and events.
❖ MAE 213: Mechanics of Materials	3	C	
❖ MAE 242: Introduction to Fluid Mechanics	3	C	
EEE 202: Circuits I	4	C	
MAE 384: Advanced Mathematical Methods for Engineers (CS)	3	C	
Term hours subtotal:	16		

Term 5 62 - 76 Credit Hours Necessary course signified by ★	Hours	Minimum Grade	Notes
★ AEE 360: Aerodynamics (L)	3	C	<ul style="list-style-type: none"> AEE 360, AEE 361 and AEE 362 must all 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.
★ AEE 361: Aerodynamics Laboratory (L)	1	C	
★ MAE 241: Introduction to Thermodynamics	3	C	
★ MAE 301: Applied Experimental Statistics	3	C	
★ MAE 318: System Dynamics and Control I	4	C	
Term hours subtotal:	14		

Term 6 76 - 93 Credit Hours Necessary course signified by ★	Hours	Minimum Grade	Notes
★ AEE 313: Aircraft Dynamics and Control	3	C	<ul style="list-style-type: none"> AEE 360, AEE 361 and AEE 362 must all 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.
★ AEE 325: Aerospace Structures and Materials	4	C	
★ AEE 344: Fundamentals of Aircraft Design	3	C	
★ AEE 362: High-Speed Aerodynamics (L)	4	C	
Social-Behavioral Sciences (SB) AND Global Awareness (G)	3		
★ Complete Cultural Diversity in the U.S. (C) AND Global Awareness (G) AND Historical Awareness (H) course(s).			
Term hours subtotal:	17		

Term 7 93 - 108 Credit Hours Necessary course signified by ★	Hours	Minimum Grade	Notes
★ AEE 463: Aircraft Propulsion	3	C	<ul style="list-style-type: none"> For additional information about Upper Division Technical Elective course options, please visit: Upper Division Technical Electives Plan for success using the Senior Guide. Use Handshake to apply for full-time positions. Complete an in person or virtual practice interview.
AEE 415: Vibration Analysis	3	C	
MAE 400: Engineering Profession (L)	3	C	
Upper Division Technical Elective	3	C	
Humanities, Arts and Design (HU)	3		
Term hours subtotal:	15		

Term 8 108 - 120 Credit Hours Necessary course signified by ★	Hours	Minimum Grade	Notes
★ AEE 468: Aircraft Systems Design	3	C	
AEE 462: Space Vehicle Dynamics and Control	3	C	

Upper Division Technical Elective	3	C
Upper Division Humanities, Arts and Design (HU) OR Upper Division Social-Behavioral Sciences (SB)	3	
Term hours subtotal:	12	

- For additional information about Upper Division Technical Electives, please visit: [Upper Division Technical Electives](#)

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Hide Course List(s)/Track Group(s)

Upper Division Technical Electives
AEE 426: Design of Aerospace Structures
AEE 465: Rocket Propulsion
AEE 466: Rotary Wing Aerodynamics and Performance
AEE 471: Computational Fluid Dynamics
BME 467: Tissue Engineering and Regenerative Medicine
BME 494: Wearable Devices for Sport, Health, and Wellness
EEE 350: Random Signal Analysis
EEE 407: Digital Signal Processing
EEE 480: Feedback Systems
EEE 481: Computer-Controlled Systems
EEE 498: Foundations Machine Learning: From Theory to Pract
MAE 341: Mechanism Analysis and Design
MAE 404: Finite Elements in Engineering
MAE 417: System Dynamics and Control II
MAE 436: Combustion
MAE 451: Applied Machine Learning for Mechanical and Aerospace Engineers
MAE 455: Polymers and Composites
MAE 460: Applied Computational Fluid Dynamics
MAE 494: Design Optimization
MAE 494: Quantum Mech Eng: SW and HW of Quantum Computers or MSE 494: Quantum Mech Eng: SW and HW of Quantum Computers
MAE 494: Theories and Techniques of Direct CAD Modeling
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

SES 494: Modeling and Analysis of Space Thermal Systems

Students may choose no more than one course from the following:

AST 321: Introduction to Planetary and Stellar Astrophysics

AST 322: Introduction to Galactic and Extragalactic Astrophysics

BME 350: Signals and Systems for Bioengineers

CEE 440: Hydrology

CHE 468: Polymer Principles and Processing

CHE 478: Biomass Energy Conversion Technology

CHE 494: Six Sigma Methodology/Engineering Experimentation

CHM 325: Analytical Chemistry

EEE 304: Signals and Systems II

EEE 333: Hardware Design Languages and Programmable Logic

EEE 334: Circuits II

EGR 317: Humanitarian Engineering Project II

EGR 433: Transforms and Systems Modeling

FSE 301: Entrepreneurship and Value Creation

FSE 394: Engineering in Global Context

FSE 404: EPICS Gold: EPICS in Action

IEE 300: Economic Analysis for Engineers

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)

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 407: Space Works II: Model, Fabricate,
Test

SES 410: Senior Exploration Project I

By approval only:

MAE 484: Internship

MAE 492: Honors Directed Study

MAE 493: Honors Thesis (L)

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 program petition prior to enrollment. Please check with your advisor.

Notes:

- First-Year Composition: All students are placed in ENG 101 unless submission of SAT, ACT, Accuplacer, IELTS, or TOEFL score, or college-level transfer credit or test credit equivalent to ASU's first-year composition course(s), determine otherwise. Students on Polytechnic, Downtown Phoenix and West Campuses are encouraged to complete the Directed Self-Placement survey to choose the first-year composition option they believe best suits their needs. Visit: <https://cisa.asu.edu/DSP>
- Mathematics Placement Assessment score determines placement in first mathematics course.

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 next to courses on the major map were valid for the 2023 - 2024 academic year. Please refer to the course catalog for current General Studies designations at time of class registration. General Studies credit is applied according to the designation the course carries at the time the class is taken.