















## 2024 - 2025 Major Map

### Mechanical Engineering, BSE

School/College: [Ira A. Fulton Schools of Engineering](#)  
ESMAEMBSE

Term 1 0 - 16 Credit Hours Critical course signified by 	Hours	Minimum Grade	Notes
 MAT 265: Calculus for Engineers I (MATH OR MA)	3	C	<ul style="list-style-type: none"> <li>ASU 101 or college-specific equivalent First-Year Seminar required of all first-year students.</li> <li>FSE 100 is required for first-year students and should be completed the first semester. Non-first year students: see advisor for petitioning replacement electives.</li> <li>If ENG 105 is taken, a 3 hour applicable elective must also be taken prior to graduation. See advisor.</li> <li>Students who have credit for CHM 113 should take CHM 116.</li> <li>Prep for success using the <a href="#">First-Year Student Guide</a>.</li> <li>Join a <a href="#">Fulton community</a>.</li> <li>Explore <a href="#">engineering and technical professions</a>.</li> </ul>
CHM 114: General Chemistry for Engineers (SCIT OR SQ) OR CHM 116: General Chemistry II (SCIT OR 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	
ASU 101-MEE: The ASU Experience	1		
FSE 100: Introduction to Engineering	2	C	
Humanities, Arts and Design (HUAD)	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
 PHY 121: University Physics I: Mechanics (SCIT OR SQ)	3	C	<ul style="list-style-type: none"> <li>Create a <a href="#">Handshake</a> profile.</li> <li>Get involved with EPICS, the Generator Labs, and the <a href="#">Fulton Start-Up Center</a>.</li> </ul>
 PHY 122: University Physics Laboratory I (SCIT OR SQ)	1	C	
 MAT 266: Calculus for Engineers II (MATH OR MA)	3	C	
 MAT 242: Elementary Linear Algebra	2	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	
Sustainability (SUST)	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"> <li>Prep for success using the <a href="#">Sophomore Guide</a>.</li> </ul>
 MAT 267: Calculus for Engineers III (MATH OR MA)	3	C	
 MAT 275: Modern Differential Equations (MATH OR MA)	3	C	

⚠ PHY 131: University Physics II: Electricity and Magnetism (SCIT OR SQ)	3	C
⚠ PHY 132: University Physics Laboratory II (SCIT OR SQ)	1	C
MAE 214: Computer-Aided Engineering I	1	C
⚠ Complete CHM 114 OR CHM 116 course(s).		
⚠ Complete First-Year Composition requirement.		
⚠ Minimum 2.00 GPA ASU Cumulative.		
Complete Mathematics (MATH) 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"> <li>Pursue an <b>undergraduate research experience</b>.</li> <li>Apply for <b>internships</b>.</li> <li>Attend <b>career fairs and events</b>.</li> </ul>
⚠ MAE 213: Mechanics of Materials	3	C	
⚠ MAE 241: Introduction to Thermodynamics	3	C	
EEE 202: Circuits I	4	C	
MAE 384: Advanced Mathematical Methods for Engineers (QTRS OR CS)	3	C	
Term hours subtotal:	16		

Term 5 62 - 77 Credit Hours Necessary course signified by ★	Hours	Minimum Grade	Notes
★ MEE 322: Structural Mechanics	3	C	<ul style="list-style-type: none"> <li>Plan for success using the <b>Junior Guide</b>.</li> <li>Network at <b>student organization</b> competitions or professional societies.</li> <li>Upper Division HUAD track course must be selected from the course list at the bottom of the major map.</li> </ul>
★ MSE 250: Structure and Properties of Materials	3	C	
★ MAE 242: Introduction to Fluid Mechanics	3	C	
MAE 301: Applied Experimental Statistics	3	C	
Upper Division HUAD Track Course	3		
Term hours subtotal:	15		

Term 6 77 - 91 Credit Hours Necessary course signified by ★	Hours	Minimum Grade	Notes
★ MEE 342: Principles of Mechanical Design	3	C	<ul style="list-style-type: none"> <li>Research and prepare for <b>graduate school</b>.</li> <li>Apply for an <b>engineering 4+1 program</b>.</li> <li>Develop a <b>professional profile online</b>.</li> <li>Upper Division SOBE track course must be selected from the course list at the bottom of the major map.</li> </ul>
★ MAE 318: System Dynamics and Control I	3	C	
★ MEE 323: Computer-Aided Engineering II	2	C	
★ MEE 340: Heat Transfer	3	C	
Upper Division SOBE Track Course	3		
Term hours subtotal:	14		

Term 7 91 - 106 Credit Hours Necessary course signified by ★	Hours	Minimum Grade	Notes
★ MEE 488: Mechanical Engineering Design I	3	C	<ul style="list-style-type: none"> <li>For additional information about Upper Division Technical Electives, please go to: <b>Upper Division Technical Electives</b>.</li> <li>Plan for success using the <b>Senior Guide</b>.</li> <li>Use <b>Handshake</b> to apply for full-time positions.</li> <li>Complete an in person or virtual <b>practice interview</b>.</li> </ul>
MAE 417: System Dynamics and Control II	3	C	
Complete 2 courses:			
Upper Division Technical Elective	6	C	
American Institutions (AMIT)	3		
Term hours subtotal:	15		

Term 8 106 - 120 Credit Hours Necessary course signified by ★	Hours	Minimum Grade	Notes
★ MEE 489: Mechanical Engineering Design II	3	C	

MEE 491: Experimental Mechanical Engineering (L)	2	C
Upper Division Technical Elective	3	C
Global Communities, Societies and Individuals (GCSI)	3	
Governance and Civic Engagement (CIVI)	3	
Term hours subtotal:	14	

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

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

Upper Division Humanities, Arts and Design (HUAD) Track Courses	Upper Division Social and Behavioral Sciences (SOBE) Track Courses	Upper Division Technical Electives
ARC 434: Great Cities (HUAD OR (L or HU) & H)	PAF 311: Leadership and Change (SOBE OR SB)	AEE OR MAE OR MEE Upper Division Elective
BIS 345: Organizational Ethics (HUAD OR HU)	PAF 410: Building Leadership Skills (SOBE OR SB)	AST 321: Stellar and Planetary Astrophysics
HPS 314: Philosophy of Science (HUAD OR HU)	SWU 349: Stress Management Tools II (SOBE OR SB)	AST 322: Introduction to Galactic and Extragalactic Astrophysics
PHI 330: Theory of Knowledge (HUAD OR HU)	SWU 350: Whole Person Health Across the Lifespan (SOBE OR SB)	BME 300: Bioengineering Product Design
REL 330: Native American Worldviews (HUAD OR HU & C)	POS 301: Empirical Political Inquiry (SOBE OR SB)	BME 316: Biomechanics for Biomedical Engineers
	STS 304: Science, Technology and Society (SOBE OR SB)	BME 318: Biomaterials
		BME 350: Signals and Systems for Bioengineers
		BME 467: Tissue Engineering and Regenerative Medicine
		BME 494: Bioenergy and Microbial Biotechnology
		BME 494: Neural Bases of Motor Control
		BME 494: Wearable Devices for Sport, Health, and Wellness
		CEE 361: Introduction to Environmental Engineering
		CEE 372: Transportation Engineering
		CEE 440: Hydrology
		CEE 441: Water Resources Engineering
		CEE 494: Airport Design
		CEE 494: Energy Efficient Buildings and Systems
		CEE 494: Sustainable Energy and Material Use
		CEE 494: Sustainable Energy Technologies
		CHE 468: Polymer Principles and Processing
		CHE 473: Fuel Cells and Biofuel Cells
		CHE 478: Biomass Energy Conversion Technology

CHE 494: Nanobiotechnology

CHE 494: Quantum Mechanical Simulations  
of Chemical Process or MSE 494: Quantum  
Mechanical Simulations of Chemical  
Process

CHE 494: Six Sigma  
Methodology/Engineering Experimentation

CHM 302: Environmental Chemistry

CHM 325: Analytical Chemistry

CSE 475: Foundations of Machine Learning

EEE 304: Signals and Systems II

EEE 333: Hardware Design Languages and  
Programmable Logic

EEE 334: Circuits II

EEE 350: Random Signal Analysis

EEE 360: Energy Systems and Power  
Electronics

EEE 407: Digital Signal Processing

EEE 434: Quantum Mechanics for Engineers

EEE 460: Nuclear Power Engineering

EEE 463: Electrical Power Plants

EEE 473: Electrical Machinery

EEE 480: Feedback Systems

EEE 481: Computer-Controlled Systems

EEE 498: Foundations Machine Learning:  
From Theory to Pract

EEE 498: Science and Technology of Solar  
Cell Fabrication

EGR 433: Transforms and Systems  
Modeling

EGR 455: Robotic Systems I

EGR 456: Robotic Systems II

EGR 494: Engineering in Semiconductors  
and Microelectronics

EVE 302: Environmental Engineering  
Fundamentals: Physical and Chemical  
Processes

EVE 303: Environmental Engineering  
Fundamentals: Microbiological Processes

GLG 418: Geophysics

IEE 305: Information Systems Engineering

IEE 376: Operations Research Deterministic  
Techniques/Applications

Upper Division Technical Electives  
continued

MAT 300: Mathematical Structures (L)

MAT 310: Introduction to Geometry

MAT 371: Advanced Calculus I

MAT 420: Scientific Computing

MAT 421: Applied Computational Methods  
(MATH OR CS)

MAT 423: Numerical Analysis I (MATH OR  
CS)

MAT 425: Numerical Analysis II (CS)

MAT 451: Mathematical Modeling (CS)

MAT 461: Applied Complex Analysis

MAT 462: Applied Partial Differential  
Equations

MSE 330: Thermodynamics of Materials

MSE 355: Structure and Defects

MSE 440: Mechanical Behavior of Materials

MSE 450: Introduction to Materials  
Characterization

MSE 457: Quantum Mechanics for  
Understanding Properties of Atoms and  
Solids

MSE 460: Nanomaterials in Energy  
Production and Storage

MSE 466: Electrochemical Energy Storage  
and Conversion

MSE 476: Growth and Processing of  
Semiconductors

MSE 494: Battery Materials Science and  
Engineering

MSE 494: Bioinspired Materials and  
Biomaterials

MSE 494: Electrochemical Materials Science

MSE 494: Failure Analysis of Metallic  
Materials

MSE 494: Intro to FEA for Matl Design and  
Characterization

MSE 494: Manufacturing Processes for  
Structural Materials

MSE 494: Semiconductor materials, devices,  
and fabrication

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 (QTRS OR  
CS)

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 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 484/499 can be applied toward the TE requirements.

Students may only apply ONE (1) course from the list below:

CEE 400: Earth Systems Engineering and Management (SUST OR (L or HU) & H)

EGR 317: Humanitarian Engineering Project II

FSE 301: Entrepreneurship and Value Creation

FSE 394: Engineering in Global Context

FSE 394: Interdisciplinary Mobile Application Development

FSE 404: EPICS Gold: EPICS in Action

IEE 300: Economic Analysis for Engineers

IEE 431: Engineering Administration (L)

IEE 437: Human Factors Engineering

MAE 394: Aeronautics in England

SES 407: Space Works II: Model, Fabricate, Test

SES 494: Space Works 4:Sim and Analysis

- **Total Hours:** 120
- **Upper Division Hours:** 45 minimum
- University Undergraduate Graduation Requirements

**Notes:**

Mathematics Placement Assessment score determines placement in first mathematics course.

General Studies designations listed next to courses on the major map were valid for the 2024 - 2025 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.