


















2020 - 2021 Major Map





Mechanical Engineering (Energy and Environment), BSE



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



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"> 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 first-year students. 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. If ENG 105 is taken, a 3 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-MEE: 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
 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	<ul style="list-style-type: none"> Create a Handshake profile. Get involved with EPICS, the Generator Labs, and the Fulton Start-Up Center.
 MAT 242: Elementary Linear Algebra	2	C	
 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 Historical Awareness (H)	3		
 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 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).			
 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 241: Introduction to Thermodynamics	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 - 78 Credit Hours Necessary course signified by 	Hours	Minimum Grade	Notes
 MEE 322: Structural Mechanics	4	C	<ul style="list-style-type: none"> Plan for success using the Junior Guide. Network at student organization competitions or professional societies.
CHM 231: Elementary Organic Chemistry (SQ) OR CHM 233: General Organic Chemistry I	3	C	
MAE 242: Introduction to Fluid Mechanics	3	C	
MAE 301: Applied Experimental Statistics	3	C	
MSE 250: Structure and Properties of Materials	3	C	
Term hours subtotal:	16		

Term 6 78 - 93 Credit Hours Necessary course signified by 	Hours	Minimum Grade	Notes
 MAE 318: System Dynamics and Control I	4	C	<ul style="list-style-type: none"> Research and prepare for graduate school.

★ MEE 340: Heat Transfer	3	C
MAE 400: Engineering Profession (L)	3	C
MEE 323: Computer-Aided Engineering II	2	C
MEE 342: Principles of Mechanical Design	3	C
★ Complete Cultural Diversity in the U.S. (C) AND Global Awareness (G) AND Historical Awareness (H) course(s).		
Term hours subtotal:	15	

- Apply for an engineering 4+1 program.
- Develop a professional profile online.

★ Term 7 93 - 108 Credit Hours Necessary course signified by	Hours	Minimum Grade	Notes
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★ MEE 482: Intermediate Thermodynamics	3	C
GCU 364: Energy in the Global Arena (SB & G) OR PUP 190: Sustainable Cities ((HU or SB) & G) OR SOS 171: The Thread of Energy (SB & G) OR GPH 314: Global Change (HU & G) OR HST 302: Energy Transitions and Sustainability ((HU or SB) & G & H)	3	
MAE 417: System Dynamics and Control II	3	C
MEE 491: Experimental Mechanical Engineering (L)	3	C
Upper Division Energy and Environment Technical Elective	3	C
Term hours subtotal:	15	

- For additional information about Upper Division Energy and Environment Technical Electives, please see: [Upper Division Energy and Environment Technical Electives](#).
- Plan for success using the [Senior Guide](#).
- Apply for [full-time positions](#).
- Complete an in person or virtual [practice interview](#).

★ Term 8 108 - 120 Credit Hours Necessary course signified by	Hours	Minimum Grade	Notes
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★ MEE 446: Energy Systems Design	3	C
GCU 364: Energy in the Global Arena (SB & G) OR PUP 190: Sustainable Cities ((HU or SB) & G) OR SOS 171: The Thread of Energy (SB & G) OR GPH 314: Global Change (HU & G) OR HST 302: Energy Transitions and Sustainability ((HU or SB) & G & H)	3	
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 go to: [Upper Division Technical Electives](#).

- For additional information about Upper Division Energy and Environment Technical Electives, & Upper Division Technical Electives, please go to: [Upper Division Energy and Environment Technical Electives & Upper Division Technical Electives](#)

Upper Division Energy and Environment Technical Electives	Upper Division Technical Electives	Upper Division Technical Electives continued
BIO 320: Fundamentals of Ecology	AEE OR MAE OR MEE Upper Division Elective	MAT 300: Mathematical Structures (L)
CEE 361: Introduction to Environmental Engineering	AST 321: Introduction to Planetary and Stellar Astrophysics (SQ)	MAT 310: Introduction to Geometry
CEE 440: Hydrology	AST 322: Introduction to Galactic and Extragalactic Astrophysics (SQ)	MAT 371: Advanced Calculus I
CEE 494: Energy Efficient Buildings and Systems	BME 300: Bioengineering Product Design	MAT 420: Scientific Computing
CEE 494: Sustainable Energy and Material Use	BME 316: Biomechanics for Biomedical Engineers	MAT 421: Applied Computational Methods (CS)
CEE 494: Sustainable Energy Technologies	BME 318: Biomaterials	MAT 423: Numerical Analysis I (CS)
CHE 473: Fuel Cells and Biofuel Cells	BME 350: Signals and Systems for Bioengineers	MAT 425: Numerical Analysis II (CS)
CHE 478: Biomass Energy Conversion Technology	BME 494: Bioenergy and Microbial Biotechnology	MAT 451: Mathematical Modeling (CS)
CHM 302: Environmental Chemistry	CEE 361: Introduction to Environmental Engineering	MAT 461: Applied Complex Analysis
EEE 360: Energy Systems and Power Electronics	CEE 372: Transportation Engineering	MAT 462: Applied Partial Differential Equations
EEE 460: Nuclear Power Engineering	CEE 440: Hydrology	MSE 330: Thermodynamics of Materials
EEE 463: Electrical Power Plants	CEE 494: Energy Efficient Buildings and Systems	MSE 355: Structure and Defects
EVE 302: Environmental Engineering Fundamentals: Physical and Chemical Processes	CEE 494: Sustainable Energy and Material Use	MSE 440: Mechanical Behavior of Materials
MAE 494: Energy Efficiency	CEE 494: Sustainable Energy Technologies	MSE 450: Introduction to Materials Characterization
MEE 434: Internal Combustion Engines	CHE 468: Polymer Principles and Processing	MSE 460: Nanomaterials in Energy Production and Storage
MEE 440: Renewable Energy: Mechanical Systems	CHE 473: Fuel Cells and Biofuel Cells	MSE 476: Growth and Processing of Semiconductors
MEE 441: Wind Energy	CHE 478: Biomass Energy Conversion Technology	MSE 494: Bioinspired Materials and Biomaterials
MSE 460: Nanomaterials in Energy Production and Storage	CHE 494: Nanobiotechnology	MSE 494: Electrochemical Energy Storage and Conversion
MSE 494: Electrochemical Energy Storage and Conversion	CHE 494: Six Sigma Methodology/Engineering Experimentation	MSE 494: Failure Analysis of Metallic Materials
By approval only:	CHM 302: Environmental Chemistry	MSE 494: Intro to FEA for Matl Design and Characterization
MAE 484: Internship	CHM 325: Analytical Chemistry	MSE 494: Manufacturing Processes for Structural Materials
MAE 492: Honors Directed Study	EEE 304: Signals and Systems II	PHY 310: Classical Particles, Fields, and Matter I
MAE 493: Honors Thesis (L)	EEE 333: Hardware Design Languages and Programmable Logic	PHY 361: Introductory Modern Physics
MAE 498: Pro-Seminar or MAE 499: Individualized Instruction	EEE 334: Circuits II	SES 311: Essentials of Astrobiology: Exploration for Life in the Universe
*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.	EEE 350: Random Signal Analysis	SES 350: Engineering Systems and Experimental Problem Solving
	EEE 360: Energy Systems and Power Electronics	SES 407: Space Works II: Model, Fabricate and Test
	EEE 407: Digital Signal Processing	SES 494: Modeling and Analysis of Space Thermal Systems
	EEE 434: Quantum Mechanics for Engineers	By approval only:
	EEE 460: Nuclear Power Engineering	MAE 484: Internship
		MAE 492: Honors Directed Study

EEE 463: Electrical Power Plants	MAE 493: Honors Thesis (L)
EEE 480: Feedback Systems	MAE 498: Pro-Seminar or MAE 499: Individualized Instruction
EEE 481: Computer-Controlled Systems	*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.
EEE 498: Science and Technology of Solar Cell Fabrication	Students may only apply ONE (1) course from the list below:
EGR 433: Transforms and Systems Modeling	CEE 400: Earth Systems Engineering and Management ((L or HU) & H)
EGR 455: Robotic Systems I	EGR 317: Humanitarian Engineering Project II
EGR 456: Robotic Systems II	FSE 301: Entrepreneurship and Value Creation
EGR 494: Engineering in Semiconductors and Microelectronics	FSE 394: Engineering in Global Context
EVE 302: Environmental Engineering Fundamentals: Physical and Chemical Processes	IEE 300: Economic Analysis for Engineers
GLG 418: Geophysics	IEE 431: Engineering Administration (L)
IEE 305: Information Systems Engineering (CS)	IEE 437: Human Factors Engineering
IEE 376: Operations Research Deterministic Techniques/Applications	MAE 394: Aeronautics in England

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 2020 - 2021 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.