2016 - 2017 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
CHM 114: General Chemistry for Engineers (SQ) OR CHM 116: General Chemistry II (SQ)	4	C	• An SAT, ACT, Accuplacer, IELTS, or TOEFL score determines placement into first-year composition courses. • ASU Mathematics Placement Test score determines placement in mathematics course. • ASU 101 or college-specific equivalent First-Year Seminar required of all freshman students. • ASU 101-MEE and FSE 100 required for freshmen and should be completed first semester. Non-freshmen see advisor for petitioning replacement electives. • If ENG 105 taken, a 3 hr applicable elective must also be taken prior to graduation. See advisor.
ENG 101 or ENG 102: First-Year Composition OR ENG 105: Advanced First-Year Composition OR ENG 107 or ENG 108: First-Year Composition	3	C	
MAT 265: Calculus for Engineers I (MA)	3	C	
ASU 101-MEE: The ASU Experience	1		
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 - 31 Credit Hours Critical course signified by	Hours	Minimum Grade	Notes
ENG 101 or ENG 102: First-Year Composition OR ENG 105: Advanced First-Year Composition OR ENG 107 or ENG 108: First-Year Composition	3	C	
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	
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:	15		

Term 3 31 - 46 Credit Hours Critical course signified by	Hours	Minimum Grade	Notes
MAE 212: Engineering Mechanics	4	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
!	PHY 132: University Physics Laboratory II (SQ)	1	C
	MAE 215: Introduction to Programming in MATLAB	1	C
!	Minimum 2.00 GPA ASU Cumulative.		
	Complete Mathematics (MA) requirement.		
	Term hours subtotal:	15	

Term 4 46 - 61 Credit Hours Critical course signified by !	**Hours**	**Minimum Grade**	**Notes**
! MAE 213: Solid Mechanics	3	C	
! MAE 240: Thermofluids I	4	C	
EEE 202: Circuits I	4	C	
MAE 214: Computer-Aided Engineering I	1	C	
MAE 384: Advanced Mathematical Methods for Engineers (CS)	3	C	
Term hours subtotal:	15		

Term 5 61 - 77 Credit Hours Necessary course signified by ★	**Hours**	**Minimum Grade**	**Notes**
★ MEE 340: Thermofluids II	3	C	
CHM 231: Elementary Organic Chemistry (SQ) OR CHM 233: General Organic Chemistry I	3	C	
MAE 301: Applied Experimental Statistics	3	C	
MEE 322: Structural Mechanics	4	C	
MSE 250: Structure and Properties of Materials	3	C	
Term hours subtotal:	16		

Term 6 77 - 93 Credit Hours Necessary course signified by ★	**Hours**	**Minimum Grade**	**Notes**
★ MAE 318: System Dynamics and Control	5	C	
MAE 400: Engineering Profession (L)	3	C	
MEE 323: Computer-Aided Engineering II	2	C	
MEE 342: Principles of Mechanical Design	3	C	
Upper Division Humanities, Arts and Design (HU) OR Upper Division Social-Behavioral Sciences (SB)	3		

Term hours subtotal: 16

Term 7 93 - 108 Credit Hours Necessary course signified by ★	Hours	Minimum Grade	Notes
★ MEE 482: Thermodynamics	3	C	• For additional information about Upper Division Energy and Environment Technical Electives, please see: Upper Division Energy and Environment Technical Electives • For additional information about Upper Division Technical Electives, please see: Upper Division Technical Electives
MEE 491: Experimental Mechanical Engineering (L)	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 Energy and Environment Technical Elective	3	C	
Upper Division Technical Elective	3	C	
Term hours subtotal:	15		

Term 8 108 - 120 Credit Hours Necessary course signified by ★	Hours	Minimum Grade	Notes
★ MEE 446: Energy Systems Design	3	C	• For additional information about Upper Division Technical Electives, please go to: Upper Division Technical Electives
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		
Complete 2 courses: Upper Division Technical Elective	6	C	
Term hours subtotal:	12		

- 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 Energy and Environment Technical Electives
BIO 320: Fundamentals of Ecology
CEE 361: Introduction to Environmental Engineering
CHE 494: Biomass Energy Conversion Technology
CHM 302: Environmental Chemistry

Technical Electives
AEE 313: Aircraft Dynamics and Control
AEE 415: Vibration Analysis
AEE 426: Design of Aerospace Structures
AEE 462: Space Vehicle Dynamics and Control
AEE 466: Rotary Wing Aerodynamics and Performance

EEE 360: Energy Systems and Power Electronics

EEE 460: Nuclear Power Engineering

EEE 463: Electrical Power Plants

MAE 494: Chem of Global Climate Change

MAE 494: Renewable Energy Engineering

MAE 494: Structural Materials in Nuclear Power Systems or MSE 494: Structural Materials in Nuclear Power Systems

MAE 494: Wind Energy

MEE 434: Internal Combustion Engines

MSE 460: Nanomaterials in Energy Production and Storage

By approval:

MAE 484: Internship

MAE 492: Honors Directed Study

MAE 493: Honors Thesis (L)

MAE 498: Pro-Seminar or MAE 499: Individualized Instruction

AST 321: Introduction to Planetary and Stellar Astrophysics (SQ)

AST 322: Introduction to Galactic and Extragalactic Astrophysics (SQ) or CHE 494: Special Topics

EEE 304: Signals and Systems II

EEE 334: Circuits II

EEE 350: Random Signal Analysis

EEE 460: Nuclear Power Engineering

EEE 463: Electrical Power Plants

EEE 480: Feedback Systems

FSE 301: Entrepreneurship and Value Creation or IEE 300: Economic Analysis for Engineers

MAE 341: Mechanism Analysis and Design

MAE 417: Control System Design

MAE 455: Polymers and Composites

MAE 494: Special Topics

MAT 362: Advanced Mathematics for Engineers and Scientists or higher level or MSE 494: Special Topics

PHY 310: Classical Particles, Fields, and Matter I or higher level

SES 311: Essentials of Astrobiology: Exploration for Life in the Universe or higher level (Cannot take SES 330)

By approval:

MAE 484: Internship

MAE 492: Honors Directed Study

MAE 493: Honors Thesis (L)

MAE 498: Pro-Seminar or MAE 499: Individualized Instruction

*Students may be allowed by instructor consent to take these courses without have the pre-requisites fulfilled. Courses not listed here require a department petition form. To take any 494 class, please check with your advisor first. MAE 484/498/499 can only use max of 3 credits towards TE requirements.

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 2016 - 2017 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.