2024 - 2025 Major Map

Biomedical Engineering, BSE

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

Term 1 - A 0 - 6 Credit Hours Critical course signified by	Hours	Minimum Grade	Notes
MAT 265: Calculus for Engineers I (MATH OR MA)	3	C	• ASU 101 or college-specific equivalent First-Year Seminar required of all first-year students. • If ENG 105 is taken, a three credit 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-BME: The ASU Experience	1	C	
FSE 100: Introduction to Engineering	2	C	
Term hours subtotal:	6		

Term 1 - B 6 - 12 Credit Hours Critical course signified by	Hours	Minimum Grade	Notes
MAT 266: Calculus for Engineers II (MATH OR MA)	3	C	• View ASU Online first-year student registration information here.
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	
Minimum 2.00 GPA ASU Cumulative.			
Term hours subtotal:	6		

Term 2 - A 12 - 19 Credit Hours Critical course signified by	Hours	Minimum Grade	Notes
CHM 114: General Chemistry for Engineers (SCIT OR SQ)	4	C	• Create a Handshake profile. • Get involved with EPICS, the Generator Labs, and the Fulton Start-Up Center.
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	
Term hours subtotal:	7		

Term 2 - B 19 - 26 Credit Hours Critical course signified by	Hours	Minimum Grade	Notes
MAT 267: Calculus for Engineers III (MATH OR MA)	3	C	
PHY 121: University Physics I: Mechanics (SCIT OR SQ)	3	C	
PHY 122: University Physics Laboratory I (SCIT OR SQ)	1	C	
Complete ENG 101 OR ENG 105 OR ENG 107 course(s).			
Complete FSE 100 course(s).			
Minimum 2.00 GPA ASU Cumulative.			
Term hours subtotal:	7		

Term 3 - A 26 - 32 Credit Hours Critical course signified by	Hours	Minimum Grade	Notes

BIO 181: General Biology I (SCIT OR SQ)	4	C
MAT 242: Elementary Linear Algebra	2	C
Term hours subtotal:	6	

- Prep for success using the Sophomore Guide.

Term 3 - B 32 - 39 Credit Hours Critical course signified by	Hours	Minimum Grade	Notes
PHY 131: University Physics II: Electricity and Magnetism (SCIT OR SQ)	3	C	
PHY 132: University Physics Laboratory II (SCIT OR SQ)	1	C	
STP 226: Elements of Statistics (QTRS OR CS) OR STP 231: Statistics for Life Science (QTRS OR CS)	3	C	
Minimum 2.00 GPA ASU Cumulative.			
Complete Mathematics (MATH) requirement.			
Term hours subtotal:	7		

Term 4 - A 39 - 48 Credit Hours Critical course signified by	Hours	Minimum Grade	Notes
MAT 275: Modern Differential Equations (MATH OR MA)	3	C	
BME 213: Biomedical and Bioengineering Ethics (HUAD)	3	C	
CSE 101: Introduction to Computer Science and Programming for Non-Computer Science Majors (QTRS)	3	C	
Term hours subtotal:	9		

- Pursue an undergraduate research experience.
- Apply for internships.
- Attend career fairs and events.

Term 4 - B 48 - 55 Credit Hours Critical course signified by	Hours	Minimum Grade	Notes
BME 200: Conservation Principles in Biomedical Engineering	3	C	
EEE 202: Circuits I	4	C	
Term hours subtotal:	7		

Term 5 - A 55 - 62 Credit Hours Necessary course signified by	Hours	Minimum Grade	Notes
BME 350: Signals and Systems for Bioengineers OR BIO 353: Cell Biology	3	C	
BME 235: Physiology for Engineers	4	C	
Term hours subtotal:	7		

- Plan for success using the Junior Guide.
- Network at student organization competitions or professional societies.

Term 5 - B 62 - 69 Credit Hours	Hours	Minimum Grade	Notes
BME 318: Biomaterials	4	C	
BME 331: Transport Phenomena for Biomedical Engineering	3	C	
Term hours subtotal:	7		

Term 6 - A 69 - 77 Credit Hours Necessary course signified by	Hours	Minimum Grade	Notes
BME 370: Microcomputer Applications in Biomedical Engineering OR BME 360: Control in Biological Systems AND BME 362: Methods in Molecular and Cellular Biology	3-4	C	
BME 301: Numerical Methods in Biomedical Engineering	2	C	
BME 316: Biomechanics for Biomedical Engineers	3	C	
Term hours subtotal:	8-9		

- Research and prepare for graduate school.
- Apply for an engineering 4+1 program.
- Develop a professional profile online.

Term 6 - B 77 - 83 Credit Hours	Hours	Minimum Grade	Notes
BME 300: Bioengineering Product Design	3	C	
Humanities, Arts and Design (HUAD)	3		
Term hours subtotal:	6		

Term 7 - A 83 - 90 Credit Hours Necessary course signified by ★	Hours	Minimum Grade	Notes
★ BME 417: Biomedical Engineering Capstone Design I (L)	4	C	• Plan for success using the Senior Guide. • Use Handshake to apply for full-time positions. • Complete an in person or virtual practice interview.
Sustainability (SUST)	3		
Term hours subtotal:	7		

Term 7 - B 90 - 96 Credit Hours	Hours	Minimum Grade	Notes
Upper Division Technical Elective	3	C	• Select your Upper Division Technical Elective from the approved list found at the bottom of the major map.
Global Communities, Societies and Individuals (GCSI)	3		
Term hours subtotal:	6		

Term 8 - A 96 - 103 Credit Hours Necessary course signified by ★	Hours	Minimum Grade	Notes
★ BME 490: Biomedical Engineering Capstone Design II (L)	4	C	
Social and Behavioral Sciences (SOBE)	3		
Term hours subtotal:	7		

Term 8 - B 103 - 110 Credit Hours	Hours	Minimum Grade	Notes
Complete 2 courses: Upper Division Technical Elective	7	C	• Select your Upper Division Technical Electives from the approved list found at the bottom of the major map.
Term hours subtotal:	7		

Term 9 - A 110 - 117 Credit Hours Necessary course signified by ★	Hours	Minimum Grade	Notes
★ BME 413: Biomedical Instrumentation (L) AND BME 423: Biomedical Instrumentation Laboratory (L) OR BME 467: Tissue Engineering and Regenerative Medicine	4-3	C	• Choose an Upper Division CIVI Track Course from the list at the bottom of the major map.
Upper Division CIVI Track Course	3		
Term hours subtotal:	7-6		

Term 9 - B 117 - 120 Credit Hours	Hours	Minimum Grade	Notes
American Institutions (AMIT)	3		
Term hours subtotal:	3		

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

Upper Division Technical Electives	Upper Division CIVI Track Course
BME 494: Applied Computational Behavioral Science	ASB 305: Poverty and Global Health (CIVI OR (L or SB) & C)
BME 494: Approaches for Innov Healthcare Tech	FAS 370: Family Ethnic and Cultural Diversity (CIVI OR SB & C) or AFR 370: Family Ethnic and Cultural Diversity (CIVI OR SB & C)
BME 494: Bioenergy and Microbial Biotechnology	HCD 330: Health Care Systems in the U.S. (CIVI)
BME 494: Biomechanics/Human Physical Capability	
BME 494: Biomedical Business Fundamentals	

- BME 494: Biomedical Device Design
- BME 494: Chimeras and Recombinant Organisms in Medicine
- BME 494: Clinical Neuroscience
- BME 494: Finite Element Modeling for Biomedical Application
- BME 494: Fundamentals in Scientific Proposal Writing
- BME 494: Global Persp on Tech Innovation in Neuroscience
- BME 494: Industrial Immersions
- BME 494: Introduction to Cellular Mechanobiology
- BME 494: iOS Programming for Biomedical Applications
- BME 494: IoTG for Medical Devices and Health Care
- BME 494: Medical Imaging Instrumentation
- BME 494: Molecular Medicine
- BME 494: Molecular Synthetic Biology
- BME 494: Multisensory Integration
- BME 494: Nanoscale Science and Detection Methods
- BME 494: Neural Bases of Motor Control
- BME 494: Neural Plasticity and Neurorehabilitation
- BME 494: Polymeric Drug Delivery
- BME 494: Principles of Stem Cell Technology
- BME 494: Principles of Stem Cell Technology Lab
- BME 494: Re-engineering the US Healthcare Delivery System
- BME 494: Regression Methods in R
- BME 494: Safety and Health Engineering
- BME 494: Science-based Approach: Optimize Human Performance
- BME 494: Synthetic Biology: iGEM for BME
- BME 494: Systems Biology of Disease
- BME 494: Technology for Global Health
- BME 494: Terminology & App of Medical Models of Disability

- JUS 352: The Global Politics of Human Rights (CIVI OR SB & G) or SOC 354: The Global Politics of Human Rights (CIVI OR SB & G)
- PHI 306: Applied Ethics (CIVI OR HU)
- POS 370: Law and Society (CIVI OR SB)

BME 494: Thermodynamics for Biomedical Engineers

BME 494: Wearable Devices for Sport, Health, and Wellness

- **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.