


















2024 - 2025 Major Map

Chemical Engineering, **BSE**

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

Term 1 0 - 16 Credit Hours Critical course signified by 	Hours	Minimum Grade	Notes
 CHM 113: General Chemistry I (SCIT OR SQ)	4	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 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.
 FSE 100: Introduction to Engineering	2	C	
 MAT 265: Calculus for Engineers I (MATH OR MA)	3	C	
ASU 101-CHE: The ASU Experience	1		
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	
Humanities, Arts and Design (HUAD)	3		
 Minimum 2.00 GPA ASU Cumulative.			
Term hours subtotal:	16		

Term 2 16 - 30 Credit Hours Critical course signified by 	Hours	Minimum Grade	Notes
 CHM 116: General Chemistry II (SCIT OR SQ)	4	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 (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	
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	
 Complete ENG 101 OR ENG 105 OR ENG 107 course(s).			
 Minimum 2.00 GPA ASU Cumulative.			
Term hours subtotal:	14		

Term 3 30 - 45 Credit Hours Critical course signified by 	Hours	Minimum Grade	Notes
 CHE 211: Introduction to Chemical Processing	3	C	<ul style="list-style-type: none"> For more information about Bioscience Elective course options, please visit here. Prep for success using the Sophomore Guide.
 MAT 267: Calculus for Engineers III (MATH OR MA)	3	C	
 MAT 242: Elementary Linear Algebra	2	C	
Bioscience Elective	3		
CHM 233: General Organic Chemistry I	3	C	
CHM 237: General Organic Chemistry Laboratory I	1	C	
 Complete First-Year Composition requirement.			

⚠ Minimum 2.00 GPA ASU Cumulative.

Complete Mathematics (MATH) requirement.

Term hours subtotal: 15

Term 4 45 - 60 Credit Hours Critical course signified by ⚠	Hours	Minimum Grade	Notes
⚠ CHE 231: Introduction to Transport Phenomena I: Fluids	3	C	<ul style="list-style-type: none">• For more information about the Engineering Elective, please visit here.• Pursue an undergraduate research experience.• Apply for internships.• Attend career fairs and events.
⚠ MAT 275: Modern Differential Equations (MATH OR MA)	3	C	
⚠ PHY 131: University Physics II: Electricity and Magnetism (SCIT OR SQ)	3	C	
CHM 234: General Organic Chemistry II	3	C	
Engineering Elective	3		
Term hours subtotal:	15		

Term 5 60 - 75 Credit Hours Necessary course signified by ★	Hours	Minimum Grade	Notes
★ CHE 334: Introduction to Transport Phenomena II: Heat and Mass Transfer	3	C	<ul style="list-style-type: none">• For more information about the Upper Division Advanced Chemistry/Biochemistry Technical Elective, please visit here.• Plan for success using the Junior Guide.• Network at student organization competitions or professional societies.
★ CHE 342: Introduction to Applied Chemical Thermodynamics	3	C	
CHE 384: Numerical Methods for Chemical Engineers (QTRS OR CS)	3	C	
Upper Division Advanced Chemistry/Biochemistry Technical Elective	3		
Humanities, Arts and Design (HUAD)	3		
Term hours subtotal:	15		

Term 6 75 - 90 Credit Hours Necessary course signified by ★	Hours	Minimum Grade	Notes
★ CHE 433: Modern Separations	3	C	<ul style="list-style-type: none">• Research and prepare for graduate school.• Apply for an engineering 4+1 program.• Develop a professional profile online.
★ CHE 442: Introduction to Chemical Reactor Design	3	C	
CHE 352: Chemical Engineering Lab I (L)	3	C	
Global Communities, Societies and Individuals (GCSI)	3	C	
Social and Behavioral Sciences (SOBE)	3		
Term hours subtotal:	15		

Term 7 90 - 105 Credit Hours Necessary course signified by ★	Hours	Minimum Grade	Notes
★ CHE 432: Principles of Chemical Engineering Design	3	C	<ul style="list-style-type: none">• For more information about Upper Division CHE Technical Electives, please visit here.• Plan for success using the Senior Guide.• Use Handshake to apply for full-time positions.• Complete an in person or virtual practice interview.
CHE 461: Process Dynamic Control (QTRS OR CS)	3		
CHE 451: Chemical Engineering Laboratory II	3		
Upper Division CHE Technical Elective	3		
American Institutions (AMIT)	3		
Term hours subtotal:	15		

Term 8 105 - 120 Credit Hours Necessary course signified by ★	Hours	Minimum Grade	Notes
★ CHE 462: Process Design (L)	3		<ul style="list-style-type: none">• For more information about Upper Division Advanced Chemistry/Biochemistry Technical Electives, Upper Division CHE Technical Electives, and Upper Division Natural Science or Materials Science Technical Electives, please visit: CHE Elective Course Options
Upper Division Advanced Chemistry/Biochemistry Technical Elective	3		
Upper Division CHE Technical Elective	3		
Upper Division SUST Track Course	3		
Governance and Civic Engagement (CIVI)	3		

- For a list of Engineering Electives, Upper Division Advanced Chemistry/Biochemistry Technical Electives, CHE Upper Division Technical Electives, and Upper Division Natural Science or MSE Technical Elective course options please visit: [CHE Elective Course Options](#).

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

Bioscience Electives	Engineering Elective	Upper Division CHE Technical Electives
BIO 181: General Biology I (SCIT OR SQ)	BME 235: Physiology for Engineers	CHE 4** Elective
BIO 182: General Biology II (SCIT OR SG)	BME 465: Magnetic Resonance Imaging	By approval only:
BIO 201: Human Anatomy and Physiology I (SCIT OR SG)	BME 494: Bioenergy and Microbial Biotechnology	CHE 484: Internship
BIO 202: Human Anatomy and Physiology II (SCIT OR SG)	BME 494: Biomedical Device Design	CHE 492: Honors Directed Study
BME 111: Engineering Perspectives on Biological Systems	BME 494: Finite Element Modeling for Biomedical Application	CHE 493: Honors Thesis (L)
BME 494: Chimeras and Recombinant Organisms in Medicine	BME 494: Medical Imaging Instrumentation	CHE 499: Individualized Instruction
MIC 205: Microbiology (SCIT OR SG)	BME 494: Molecular Medicine	
MIC 220: Biology of Microorganisms	BME 494: Molecular Synthetic Biology	
	BME 494: Technology for Global Health	
	CEE 210: Engineering Mechanics I: Statics	
	CEE 400: Earth Systems Engineering and Management (SUST OR (L or HU) & H)	
	CEE 494: Bio-inspired Design	
	CEE 494: Sustainable Energy and Material Use	
	CSE 205: Object-Oriented Programming and Data Structures (QTRS OR CS)	
	DAT 301: Exploring Data in R and Python	
	EEE 202: Circuits I	
	EEE 241: Fundamentals of Electromagnetics	
	EEE 307: Signal Processing for Digital Culture	
	EEE 498: Manufacturing Science of Solar Cells	
	EEE 498: Renewable Energy Technology and Systems	
	EEE 498: Science and Technology of Solar Cell Fabrication	
	EGR 494: Engineering in Semiconductors and Microelectronics	
	FSE 301: Entrepreneurship and Value Creation	
	FSE 394: Engineering for Humanity	

	FSE 394: Engineering in Global Context
	FSE 494: Nuclear Prolif Secur & Safegrd
	IEE 300: Economic Analysis for Engineers
	IEE 380: Probability and Statistics for Engineering Problem Solving (QTRS OR CS)
	IEE 385: Engineering Statistics: Probability
	MAE 494: Quantum Mech Eng: SW and HW of Quantum Computers or MSE 494: Quantum Mech Eng: SW and HW of Quantum Computers
	MSE 250: Structure and Properties of Materials
	MSE 435: Computational Materials Science and Engineering
	MSE 460: Nanomaterials in Energy Production and Storage
	MSE 466: Electrochemical Energy Storage and Conversion
	MSE 494: Bioinspired Materials and Biomaterials
	MSE 494: Electrochemical Materials Science
	MSE 494: Failure Analysis of Metallic Materials
	MSE 494: Manufacturing Processes for Structural Materials
	Note: MSE 208, 301, or 308 cannot be used.
	Note: Students taking IEE 380 or IEE 385 cannot take STP 420 or STP 421 for Natural Science/Materials Elective.
Upper Division Sustainability (SUST) Courses	Upper Division Advanced Chemistry/Biochemistry Technical Elective
BIO 324: Environmental Ethics (SUST OR HU)	BCH 341: Physical Chemistry with a Biological Focus or CHM 345: Physical Chemistry I or CHM 341: Elementary Physical Chemistry
CEE 400: Earth Systems Engineering and Management (SUST OR (L or HU) & H)	BCH 361: Advanced Principles of Biochemistry
CNE 400: Earth Systems Engineering and Management (SUST OR (L or HU) & H)	BCH 461: General Biochemistry
ECN 345: Survey of Energy and Environmental Economic Issues (SUST)	BCH 463: Biophysical Chemistry
GPH 414: Climate Change (SUST OR G)	BCH 494: Biochemistry of Cancer
PHI 310: Environmental Ethics (SUST OR HU)	BCH 494: Chemical Biology or CHM 494: Chemical Biology
SCM 385: Business and Sustainability I (SUST)	BCH 494: Molecular Diagnostics
	BCH 494: Protein Biochemistry

SOS 385: Business and Sustainability I
(SUST)

CHM 302: Environmental Chemistry

CHM 325: Analytical Chemistry

CHM 433: Advanced Organic Chemistry I

CHM 435: Medicinal Chemistry

CHM 453: Inorganic Chemistry

CHM 471: Solid-State Chemistry

CHM 481: Geochemistry or GLG 481:
Geochemistry

CHM 494: Advanced Electrochemistry

CHM 494: Bioinorganic

CHM 494: Characterization Meth.of
Inorg.Compounds&Materials

CHM 494: Chemistry of Atmospheres

CHM 494: Environmental Monitoring and
Assessment Techniques

CHM 494: Nanomaterials

CHM 494: Organometallic Chemistry

CHM 494: Solar Energy Conversion

CHM 494: Sustainable Macromolecular
Synthesis

CHM 494: The Business of Chemistry

CHM 494: Thermodynamics of Natural
Systems

- **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.