2018 - 2019 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 (SQ)	4	C	• 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 freshman students. • ASU 101-CHE and FSE 100 required for freshmen and should be completed first semester. Non-freshmen: see advisor for petitioning replacement electives. • If ENG 105 is taken, a 3 hr applicable elective must also be taken prior to graduation. See Advisor. • Prep for success using the Freshman Guide. • Join a Fulton community. • Explore engineering and technical professions.
FSE 100: Introduction to Engineering	2	C	
MAT 265: Calculus for Engineers I (MA)	3	C	
ASU 101-CHE: The ASU Experience	1		
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	
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 - 30 Credit Hours Critical course signified by	**Hours**	**Minimum Grade**	**Notes**
CHM 116: General Chemistry II (SQ)	4	C	• Create a Handshake profile. • Get involved with EPICS, the Generator Labs, and the Fulton Start-Up Center.
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	
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	
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	• For more information about Bioscience Elective course options, please visit here.
MAT 242: Elementary Linear Algebra	2	C	

!	MAT 275: Modern Differential Equations (MA)	3	C
	CHM 233: General Organic Chemistry I	3	C
	CHM 237: General Organic Chemistry Laboratory I	1	C
	Bioscience Elective	3	
!	Minimum 2.00 GPA ASU Cumulative.		
	Complete Mathematics (MA) requirement.		
	Term hours subtotal:	15	

- Prep for success using the Sophomore Guide.
- Consult the Resume, Presentation, and Resource Library for tips on how to create a technical resume, job shadow, do informational interviews and mentor with alumni.
- Create a technical resume.

Term 4 45 - 60 Credit Hours Critical course signified by !	**Hours**	**Minimum Grade**	**Notes**
! CHE 231: Introduction to Transport Phenomena I: Fluids	3	C	• Pursue an undergraduate research experience. • Apply for internships. • Attend career fairs and events.
! MAT 267: Calculus for Engineers III (MA)	3	C	
! PHY 131: University Physics II: Electricity and Magnetism (SQ)	3	C	
CHE 384: Numerical Methods for Chemical Engineers (CS)	3	C	
CHM 234: General Organic Chemistry II	3	C	
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	• For more information about the Engineering Elective or 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	
Upper Division Advanced Chemistry/Biochemistry Technical Elective	3		
Engineering Elective	3		
Social-Behavioral Sciences (SB) AND Historical Awareness (H)	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	• 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	
IEE 220: Business and Industrial Engineering	3	C	
Social-Behavioral Sciences (SB) AND Global Awareness (G)	3		

★	Complete Cultural Diversity in the U.S. (C) AND Global Awareness (G) AND Historical Awareness (H) course(s).		
	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	• 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 451: Chemical Engineering Laboratory II	3		
CHE 461: Process Dynamic Control (CS)	3		
Upper Division CHE Technical Elective	3		
Humanities, Arts and Design (HU)	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		• 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 here.
Upper Division Advanced Chemistry/Biochemistry Technical Elective	3		
Upper Division CHE Technical Elective	3		
Upper Division Natural Science or Materials Science Technical Elective	3		
Upper Division Humanities, Arts and Design (HU) OR Upper Division Social-Behavioral Sciences (SB)	3		
Term hours subtotal:	15		

- 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
BIO 181: General Biology I (SQ)
BIO 182: General Biology II (SG)
BIO 201: Human Anatomy and Physiology I (SG)
BME 111: Engineering Perspectives on Biological Systems
MIC 205: Microbiology (SG)
MIC 220: Biology of Microorganisms

Engineering Elective
BME 2** Elective
CEE 2** Elective (CEE 210 OR CEE 300 recommended)
CSE 2** Elective
EEE 2** Elective (EEE 202 recommended)
IEE 2** Elective
MAE 2** Elective

Upper Division CHE Technical Electives
CHE 400 to CHE 489
CHE 469: Air Quality Engineering
CHE 475: Biochemical Engineering
CHE 484 by approval
CHE 492/493 max of 6 credits towards CHE TE requirements
CHE 494 by approval
CHE 498/499 by approval

Contact your advisor for additional course options

MSE 2** Elective (MSE 250 recommended)

Note: MSE 208, 301, or 308 cannot be used

FSE 301: Entrepreneurship and Value Creation

IEE 300: Economic Analysis for Engineers

IEE 380: Probability and Statistics for Engineering Problem Solving (CS)

Contact your advisor for additional course options

If interested in a course from a " 2** " range, please work with your advisor for prior approval. Not all courses will be accepted.

Note: Students may be allowed by instructor consent to take these courses without having the prerequisites fulfilled. Courses not listed here require a department petition form.

Upper Division Advanced Chemistry/Biochemistry Technical Elective

BCH 361: Advanced Principles of Biochemistry

BCH 461: General Biochemistry

CHM 302: Environmental Chemistry

CHM 325: Analytical Chemistry

CHM 341: Elementary Physical Chemistry

CHM 453: Inorganic Chemistry

CHM 481: Geochemistry

Contact your advisor for additional course options

Upper Division Natural Science or Materials Engineering Technical Electives

BIO 302: Cancer--Mother of All Diseases (L)

BIO 320: Fundamentals of Ecology

BIO 325: Oceanography

BIO 340: General Genetics

BIO 353: Cell Biology

MSE 355: Structure and Defects

MSE 460: Nanomaterials in Energy Production and Storage

GLG 321: Mineralogy

GLG 418: Geophysics

GLG 419: Geodynamics

MBB 347: Molecular Genetics: From Genes to Proteins

MIC 360: Bacterial Physiology

MIC 461: Geomicrobiology

STP 420: Introductory Applied Statistics (CS) or STP 421: Probability

Note: Students taking STP 420 or STP 421 cannot take IEE 380 for Engineering Elective

Contact your advisor for additional course options

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 2018 - 2019 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.