Curriculum - Chemical Engineering, BSE

Catalog Year: 2026 - 2027 **General Studies Gold**

Degree: Bachelor of Science in Engineering, BSE

College/School: Ira A. Fulton Schools of Engineering

Plan Code: ESCHEBSE

Minimum credit hours: 120

Upper division minimum credit hours: 45

Requirement	Minimum Grade	Credit Hours
Chemical Engineering Lower Division		
CHE 211 Introduction to Chemical Processing	C	3
CHE 231 Introduction to Transport Phenomena I: Fluids	C	3
FSE 100 Introduction to Engineering	C	2
Chemical Engineering Upper Division		
CHE 334 Introduction to Transport Phenomena II: Heat and Mass Transfer	C	3
CHE 342 Introduction to Applied Chemical Thermodynamics	C	3
CHE 352 Chemical Engineering Lab I	C	3
CHE 384 Numerical Methods for Chemical Engineers (QTRS)	C	3
CHE 432 Principles of Chemical Engineering Design	C	3
CHE 433 Modern Separations	C	3
CHE 442 Introduction to Chemical Reactor Design	C	3

Requirement	Minimum Grade	Credit Hours
CHE 451 Chemical Engineering Laboratory II		3
CHE 461 Process Dynamic Control (QTRS)		3
CHE 462 Process Design		3

Chemical Engineering Technical Electives

Upper Division Advanced Chemistry/Biochemistry Technical Elective — Minimum Grade: C — Credit Hours: 6

*Students who do not meet the enrollment requirements for these courses (excluding CHE prefixes) may be allowed to enroll with instructor consent. Courses not listed here require a department petition form.

- BCH 341 Physical Chemistry with a Biological Focus **or** CHM 341 Elementary Physical Chemistry **or** CHM 345 Physical Chemistry I
- BCH 361 Principles of Biochemistry
- BCH 461 General Biochemistry I
- BCH 463 Biophysical Chemistry
- BCH 494 Topic: Biochemistry of Cancer
- BCH 494 / CHM 494 Topic: Chemical Biology
- BCH 494 Topic: Molecular Diagnostics
- BCH 494 Topic: Protein Biochemistry
- CHM 302 Environmental Chemistry
- CHM 325 Analytical Chemistry
- CHM 433 Bioorganic Chemistry
- CHM 435 Medicinal Chemistry
- CHM 453 Inorganic Chemistry

Requirement	Minimum Grade	Credit Hours
CHM 471 Solid-State Chemistry		
CHM 481 / **GLG 481 Geochemistry**		
CHM 494 Topic: Advanced Electrochemistry		
CHM 494 Topic: Bioinorganic		
CHM 494 Topic: Characterization Meth.of Inorg.Compounds&Materials		
CHM 494 Topic: Chemistry of Atmospheres		
CHM 494 Topic: Chemistry for Sustainability		
CHM 494 Topic: Environmental Monitoring and Assessment Techniques		
CHM 494 Topic: Nanomaterials		
CHM 494 Topic: Organometallic Chemistry		
CHM 494 Topic: Solar Energy Conversion		
CHM 494 Topic: Sustainable Macromolecular Synthesis		
CHM 494 Topic: The Business of Chemistry		
CHM 494 Topic: Thermodynamics of Natural Systems		
CHM 494 Topic: Polymers are Everywhere		
Upper Division Chemical Engineering Technical Elective	C	6
*Students MUST meet pre-requisites for all CHE courses prior to enrollment. To take any 494 class, please check with your advisor first. A max of 3 credits from CHE 484/498/499 can be applied toward the TE requirements.		
400-Level CHE Elective		
By approval only:		
CHE 484 Internship		

Requirement	Minimum Grade	Credit Hours
CHE 492 Honors Directed Study		
CHE 493 Honors Thesis		
CHE 498 Pro-Seminar		
CHE 499 Individualized Instruction		

Upper Division Interdisciplinary Requirements

ECN 345 Survey of Energy and Environmental Economic Issues (SUST) OR HST 345 Environmental History (SUST) OR SCM 385 Business and Sustainability I (SUST) or SOS 385 Business and Sustainability I (SUST) OR BIO 324 Environmental Ethics (SUST) or PHI 310 Environmental Ethics (SUST)	C	3

Chemical Engineering Major GPA

Check: Minimum 2.0 Major GPA

Math, Science, and Interdisciplinary Requirements

MAT 265 Calculus for Engineers I (MATH)	C	3
MAT 266 Calculus for Engineers II (MATH)	C	3
MAT 267 Calculus for Engineers III (MATH)	C	3
MAT 242 Elementary Linear Algebra	C	2
MAT 275 Modern Differential Equations (MATH)	C	3
CHM 113 General Chemistry I (SCIT)	C	4
CHM 116 General Chemistry II (SCIT)	C	4

CHM 233 General Organic Chemistry I	C	3
CHM 237 General Organic Chemistry Laboratory I	C	1
CHM 234 General Organic Chemistry II	C	3
PHY 121 University Physics I: Mechanics (SCIT)	C	3
PHY 122 University Physics Laboratory I (SCIT)	C	1
PHY 131 University Physics II: Electricity and Magnetism (SCIT)	C	3

Bioscience Elective

*Students who do not meet the enrollment requirements for these courses (excluding CHE prefixes) may be allowed to enroll with instructor consent. Courses not listed here require a department petition form.

BIO 181 General Biology I (SCIT)	3
BIO 182 General Biology II (SCIT)	
BIO 201 Human Anatomy and Physiology I (SCIT)	
BIO 202 Human Anatomy and Physiology II (SCIT)	
BME 111 Engineering Perspectives on Biological Systems	
BME 494 Topic: Chimeras and Recombinant Organisms in Medicine	
MIC 205 Microbiology (SCIT)	
MIC 220 Biology of Microorganisms	

Engineering Elective

Engineering Elective 3

*Students who do not meet the enrollment requirements for these courses (excluding CHE prefixes) 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.

BME 235 Physiology for Engineers

BME 465 Magnetic Resonance Imaging

BME 494 Topic: Biomedical Device Design

BME 494 Topic: Finite Element Modeling for Biomedical Application

BME 494 Topic: Medical Imaging Instrumentation

BME 494 Topic: Molecular Medicine

BME 494 Topic: Molecular Synthetic Biology

BME 494 Topic: Technology for Global Health

CEE 210 Engineering Mechanics I: Statics

CEE 400 Earth Systems Engineering and Management

CEE 494 Topic: Bio-inspired Design

CEE 494 Topic: Sustainable Energy and Material Use

CSE 205 Object-Oriented Programming and Data Structures

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 Topic: Manufacturing Science of Solar Cells

EEE 498 Topic: Renewable Energy Technology and Systems

EEE 498 Topic: Science and Technology of Solar Cell Fabrication

EGR 494 Topic: Engineering in Semiconductors and Microelectronics

FSE 301 Entrepreneurship and Value Creation

FSE 394 Topic: Engineering in Global Context

IEE 300 Economic Analysis for Engineers

IEE 380 Probability and Statistics for Engineering Problem Solving (QTRS)

IEE 385 Engineering Statistics: Probability

MAE 494 / MSE 494 Topic: 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 Topic: Bioinspired Materials and Biomaterials

MSE 494 Topic: Electrochemical Materials Science

MSE 494 Topic: Failure Analysis of Metallic Materials

MSE 494 Topic: Manufacturing Processes for Structural Materials

ASU 101 or College-Specific First-Year Seminar

ASU 101 or college-specific equivalent First-Year Seminar required of all first-year students.

ASU 101-SEM The ASU Experience		1

First-Year Composition

ENG 101 First-Year Composition **AND** ENG 102 First-Year Composition **OR** ENG 105 Advanced First-Year Composition **OR** ENG 107 First-Year Composition **AND** ENG 108 First-Year Composition	C	6

Notes

All baccalaureate degree students must fulfill university graduation requirements, including a minimum of 120 credit hours, with at least 45 credit hours in upper-division courses.

All undergraduate students must complete General Studies requirements.

Mathematics Placement Assessment score determines placement in first mathematics course.

Students should work with their academic advisor, and consider course prerequisites, in order to complete all degree requirements in four years.

General Studies designations listed next to courses were valid for the 2026 - 2027 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.