

CHEMICAL FOCUS AREA: Energy & Environment

Department of Chemical and Biochemical Engineering

General Education (19 sh)		sh
ALL	RHET:1030 Rhetoric	4
F/S	Diversity & Inclusion	3
ALL	Be Creative	3
ALL	Approved Gen Ed Course	3
ALL	Approved Gen Ed Course	3
ALL	Approved Gen Ed Course	3

Math & Basic Science Core (24 sh)		sh
F/S	MATH:1550 Math I: Single Variable Calculus (P: ALEKS score ≥ 75 or MPT Level 3 score ≥ 9)	4
ALL	MATH:1560 Math II: Multivariable Calculus (P: MATH:1550)	4
ALL	MATH:2550 Math III: Matrix Algebra (P: MATH:1550)	2
ALL	MATH:2560 Math IV: Differential Equations (P: MATH:1560 & MATH:2550)	3
ALL	CBE:3020 Appl Stat Chem & Natural Resource Eng	3
ALL	STAT:2020 Probability & Stats for Engr & Phys Sci (P: MATH:1560)	3
ALL	STAT:3510 Biostatistics	3
ALL	CHEM:1110 Principles of Chemistry I (P: ALEKS score ≥ 55 or MPT Level 3 score ≥ 9)	4
ALL	PHYS:1611 Introductory Physics I / Lab (C: MATH:1550)	4

Engineering Core (7 sh)		sh
F	ENGR:1000 Engineering Success for First-Year Students (First semester standing)	1
F	ENGR:1100 Intro to Engineering Problem Solving	3
F/S	ENGR:1300 Intro to Engineering Computing (C: MATH:1550)	3

ChemE Requirements (53 sh)		sh
ALL	CHEM:1120 Principles of Chemistry II (P: CHEM:1110 with a minimum grade of C-)	4

ALL	CHEM:2210 Organic Chemistry I (P: CHEM:1120 with a minimum grade of C-)	3	OR
F	CHEM:2230 Organic Chemistry I for Majors (P: CHEM:1120 with a minimum grade of C-)	3	

ALL	CHEM:2220 Organic Chemistry II (P: CHEM:2210 or CHEM:2230 with a minimum grade of C-)	3	OR
S	CHEM:2240 Organic Chemistry II for Majors (P: CHEM:2210 or CHEM:2230 with a minimum grade of C-)	3	

ALL	CHEM:2410 Organic Chemistry Laboratory (P: CHEM:1120 & (CHEM:2210 or CHEM:2230), both with a minimum grade of C-; C: CHEM:2220 or CHEM:2240)	3	OR
S	CHEM:2420 Organic Chemistry Lab for Majors (P: CHEM:1120 & (CHEM:2210 or CHEM:2230), both with a minimum grade of C-; C: CHEM:2220 or CHEM:2240)	3	

ALL	ENGR:2130 Thermodynamics (P: CHEM:1110 & PHYS:1611; C: MATH:1560)	3
ALL*	ENGR:2720 Materials Science (P: CHEM:1110; C: MATH:1550)	3
F	CBE:2110 Computational Tools for Chemical Engineers (P: MATH:1550; C: MATH:1560)	2
F/S	CBE:2105 Process Calculations (P: MATH:1550)	3
S	CBE:3105 ChE Thermodynamics (P: ENGR:2130; C: CBE:2105)	3
S	CBE:3109 Fluid Flow (C: CBE:2105)	2
F	CBE:3113 Heat & Mass Transfer (P: MATH:2560 & CBE:2105; R: CBE:3109)	3
F	CBE:3117 Separations (P: CBE:2105 & CBE:3105; C: CBE:3113)	3
F/S	CBE:3120 Chemical Reaction Engineering (P: MATH:2560; C: CBE:3105; R: CBE:3113)	3
F	CBE:3125 Chemical Process Safety (P: CBE:3105 & CBE:3109; C: CBE:3113)	3
S	CBE:3150 Thermodynamics / Transport Laboratory (P: CBE:3105 & CBE:3113)	3
F	CBE:3155 Chemical Reaction Engineering / Separation Lab (P: CBE:3117; C: CBE:3120; R: Statistics Elective)	3
S	CBE:3205 Introduction Biochemical Engineering (P: CBE:2105; C: CME:3109; R: CBE:3120)	3
F	CBE:4105 Process Dynamics & Control (P: MATH:2560, CBE:2105, & CBE:3109; C: CBE:3120)	3

ChemE Capstone Design Courses (5 sh)		sh
F	CBE:4109 Chemical Engineering Process Design I (P: CBE:3109, CBE:3113, & CBE:3117; C: CBE:3120 & CBE:3125)	2
S	CBE:4110 Chemical Engineering Process Design II (P: CBE:4109; R: CBE:4105 & CBE:3205)	3

ChemE Departmental Seminars (5 sh)		sh
S	CBE:1000 CBE Departmental Seminar	1
F/S	CBE:3000 CBE Professional Seminar (1 sh x4) (P: CBE:2105)	4
S	CBE:4195 Senior Enriching Activities Seminar (C: CBE:4110)	0

Required:		3 sh
S	CBE:5405 Green Chemical And Energy Technologies (spring semester, odd years) (P: CBE:2105)	3

Engineering Electives:		sh
F/S	ENGR:2995 Intro to AI and Machine Learning in Engineering (P: ENGR:1300; C: MATH:2550)	3
S	CBE:2030 Energy and Society	3
S	CBE:2040 Environment, Energy, and Climate Change (offered online)	3
F/S	CBE:2050 Severe and Unusual Weather (offered online)	3
S	CBE:4459 Air Pollution Control Technology	3
S	CBE:5412 Atmospheric Modeling (see MyUI for offerings)	3
S	CBE:5410 Electrochemical Engineering (see MyUI for offerings)	3
S	CEE:4107 Sustainable Systems	3
F	CEE:5380 Fluid Flow in Environmental Systems	3
F	ME:4048 Energy Systems Design (P: ME:3045)	4
F	ECE:5630 Sustainable Energy Conversion (fall semester, even years) (P: ENGR:2120 & PHYS:1611; Requirements: junior standing)	3

Electives: Advanced Chemistry / Science (6 sh)		sh
	Advanced Chemistry or Biochemistry Course	3
	Advanced Science Course	3

Science Electives:		sh
S	CEE:5440 Foundations of Environmental Chemistry and Microbiology	3
S	OEH:6710 Human Toxicology and Risk Assessment (Requirements: college chemistry and biology)	3
S	CBE:4420 Environmental Chemistry I (P: CHEM:1120)	3
S	CBE:5415 Satellite image processing and remote sensing of atmosphere (see MyUI for offerings)	3
F	CBE:5417 Physical Meteorology & Atmospheric Radiative Transfer (Requirements: senior or graduate standing)	3
S	CBE:5425 Atmospheric Chemistry & Physics (spring semester, even years) (C: CBE:3120)	3
F	EES:4490 Elements of Geochemistry (fall semester, even years) (P: EES:1030 or EES:1050) & (CHEM:1070 or CHEM:1110)	3
S	EES:4520 Isotope Geochemistry (see MyUI for offerings)	3
S	EES:4630 Hydrogeology (P: (MATH:1860 or MATH:1560) & (PHYS:1612 or PHYS:1512) & CHEM:1120)	4
F	EES:4790 Applied Environmental Geology (P: EES:1030 or EES:1080 or EES:1050)	3
S	CHEM:4873 Atmospheric and Environmental Chemistry (C: CHEM:4431 or CHEM:4432)	3
S	CHEM:5107 Electrochemistry (see MyUI for offerings) (Recommended: CHEM:3110, CHEM:3120, & CHEM:3172)	2
S	CHEM:5438 Surface Chemistry and Heterogeneous Processes (spring semester, odd years) (Recommended: CHEM:4431)	3

3000-level or higher Courses in Geoscience, Occupational & Environmental Health, Chemistry, and Geography – consult with academic advisor

Total Semester Hours Requirements: 134