

CHEMICAL ENGINEERING, BS

for the degree of Bachelor of Science in Chemical Engineering (Specialized Curriculum)

General education: Students must complete the Campus General Education (<https://courses.illinois.edu/gened/DEFAULT/DEFAULT/>) requirements including the campus general education language requirement.

Minimum required major and supporting course work: A grade point average of 2.5 or higher in all courses required for the major earned on the UIUC campus is required in order to be accepted by the department as juniors and seniors.

Minimum hours required for graduation: The curriculum requires 129 hours for graduation and is organized as shown below.

Orientation and Professional Development

These courses introduce opportunities and resources the college, department, and curriculum offers students. They also provide background on the Chemical Engineering curriculum, what chemical engineers do, and the skills to work effectively and successfully in the engineering profession.

Code	Title	Hours
CHBE 121	CHBE Profession ¹	1
ENG 100	Grainger Engineering Orientation Seminar ¹	0
Total Hours		1

Foundational Mathematics and Science

These courses stress the basic mathematical and scientific principles upon which the engineering discipline is based.

Code	Title	Hours
CHEM 202	Accelerated Chemistry I ²	3
CHEM 203	Accelerated Chemistry Lab I	2
CHEM 204	Accelerated Chemistry II	3
CHEM 205	Accelerated Chemistry Lab II	2
MATH 221	Calculus I ³	4
MATH 231	Calculus II	3
MATH 241	Calculus III	4
MATH 285	Intro Differential Equations ⁴	3
MATH 415	Applied Linear Algebra	3
PHYS 211	University Physics: Mechanics	4
PHYS 212	University Physics: Elec & Mag	4
PHYS 214	Univ Physics: Quantum Physics	2
Total Hours		37

Chemical and Biomolecular Engineering Technical Core

These courses stress fundamental concepts and basic laboratory techniques that comprise the common intellectual understanding of chemical engineering and chemical science.

Code	Title	Hours
CHBE 221	Principles of CHE	3
CHBE 321	Thermodynamics	4
CHBE 421	Momentum and Heat Transfer	4
CHBE 422	Mass Transfer Operations	4
CHBE 424	Chemical Reaction Engineering	3
CHBE 430	Unit Operations Laboratory	4
CHBE 431	Process Design	4
CHBE 440	Process Control and Dynamics	3
CHEM 236	Fundamental Organic Chem I	4
CHEM 237	Structure and Synthesis	2
CHEM 315	Instrumental Chem Systems Lab ⁵	2
CHEM 420	Instrumental Characterization	2
CHEM 442	Physical Chemistry I	4

CS 101	Intro Computing: Engrg & Sci	3
IE 300	Analysis of Data	3
Total Hours		49

For Chemical Engineering

Code	Title	Hours
Technical Core		49
CHEM 436 or MCB 450	Fundamental Organic Chem II Introductory Biochemistry	3
Total Hours		52

Technical Electives

These courses stress the rigorous analysis and design principles practiced in the major subdisciplines of chemical engineering embodied in the chemical engineering and biomolecular engineering concentrations.

For Chemical Engineering

Code	Title	Hours
Selected from the departmentally approved List of Approved Chemical Engineering Technical Electives, satisfying these distribution requirements: ⁶		
400-level ChBE courses, with not more than 3 hours being CHBE 497 or CHBE 499 ⁷		6
Any 400-level course from List 1 ⁷		3
Any courses from List 1 ⁷		6
Any 400-level course from List 2		4
Total Hours		19

Social Sciences and Humanities

The social sciences and humanities courses ensure that students have exposure in breadth and depth to areas of intellectual activity that are essential to the general education of any college graduate.

Code	Title	Hours
General education courses to satisfy the university requirements for social & behavioral sciences, humanities & the arts, and cultural studies (Non-Western, U.S. Minority, and Western Cultures).		16

Composition

These courses teach fundamentals of expository writing.

Code	Title	Hours
RHET 105	Writing and Research	4
Advanced Composition (satisfied by completing the sequence CHBE 430 and CHBE 431 in the Chemical Engineering Technical Core).		
Total Hours		4

1

For students entering the curriculum after the freshman year, 1 additional hour of credit from the list of approved engineering technical electives may be substituted in place of CHBE 121.

2

Students who do not place into CHEM 202, or who do not satisfy the mathematics prerequisite for CHEM 202, may substitute the sequence CHEM 102, CHEM 103, CHEM 104, CHEM 105, CHEM 222, and CHEM 223 for CHEM 202, CHEM 203, CHEM 204, and CHEM 205.

3

MATH 220 may be substituted, with four of the five credit hours applying toward the degree. MATH 220 is appropriate for students with no background in calculus.

4

MATH 441 may be substituted for MATH 285. MATH 286 (4 hours) may be substituted for MATH 285 (3 hours).

5

Students must register in one of the Chemical Engineering-specific CHEM 315 lab sections.

6

List of Approved Chemical Engineering Technical Electives. (<http://chbe.illinois.edu/wp-content/uploads/2015/11/Technical.Electives.Current.pdf>)

7

A maximum of 10 total hours of undergraduate research may be counted toward Technical Elective credit.