

# BS in Chemical Engineering

## Program Codes:

20FQ0300BS

## Degree Requirements

To earn a Bachelor of Science in Chemical Engineering degree from UIC, students need to complete university, college, and department degree requirements. The Department of Chemical Engineering degree requirements are outlined below. Students should consult the *College of Engineering* section for additional degree requirements and college academic policies.

Code	Title	Hours
<b>Summary of Requirements</b>		
Nonengineering and General Education Requirements		73
Required in the College of Engineering		49
Technical Elective <sup>a</sup>		3
Electives outside the Major Rubric <sup>a</sup>		3
Total Hours		128

<sup>a</sup> Students in the Biochemical Engineering Concentration take a minimum of 8 hours of electives and 130 hours for the degree; see below.

## Nonengineering and General Education Requirements

Code	Title	Hours
<b>Required Courses</b>		
ENGL 160	Academic Writing I: Writing in Academic and Public Contexts	3
ENGL 161	Academic Writing II: Writing for Inquiry and Research	3
Exploring World Cultures course <sup>a</sup>		3
Understanding the Creative Arts course <sup>a</sup>		3
Understanding the Past course <sup>a</sup>		3
Understanding the Individual and Society course <sup>a</sup>		3
Understanding U.S. Society course <sup>a</sup>		3
MATH 180	Calculus I <sup>b</sup>	4
MATH 181	Calculus II <sup>b</sup>	4
MATH 210	Calculus III <sup>b</sup>	3
MATH 220	Introduction to Differential Equations	3
PHYS 141	General Physics I (Mechanics) <sup>b</sup>	4
PHYS 142	General Physics II (Electricity and Magnetism) <sup>b</sup>	4
CHEM 122	General Chemistry I Lecture	5
& CHEM 123	and General Chemistry Laboratory I <sup>b</sup>	
or CHEM 116 Honors and Majors General and Analytical Chemistry I		
CHEM 124	General Chemistry II Lecture	5
& CHEM 125	and General Chemistry Laboratory II <sup>b</sup>	
or CHEM 117 Honors and Majors General and Analytical Chemistry II		
CHEM 222	Analytical Chemistry <sup>c</sup>	4
CHEM 232	Organic Chemistry I	4

CHEM 233	Organic Chemistry Laboratory I	2
CHEM 234	Organic Chemistry II	4
CHEM 342	Physical Chemistry I	3
CHEM 346	Physical Chemistry II	3
Total Hours		73

- <sup>a</sup> Students should consult the General Education (<http://catalog.uic.edu/ucat/degree-programs/general-education>) section of the catalog for a list of approved courses in this category.
- <sup>b</sup> This course is approved for the Analyzing the Natural World General Education category.
- <sup>c</sup> Students who take CHEM 116 and CHEM 118 to fulfill the general chemistry requirement do not need to take CHEM 222. Instead they should enroll in one of the following: CHEM 314, CHEM 452, CHEM 402, or CHEM 444.

## Required in the College of Engineering

Code	Title	Hours
<b>Required Courses</b>		
ENGR 100	Engineering Orientation <sup>a</sup>	1
CHE 201	Introduction To Thermodynamics	3
CHE 205	Computational Methods in Chemical Engineering	3
CHE 210	Material and Energy Balances	4
CHE 301	Chemical Engineering Thermodynamics	3
CHE 311	Transport Phenomena I	3
CHE 312	Transport Phenomena II	3
CHE 313	Transport Phenomena III	3
CHE 321	Chemical Reaction Engineering	3
CHE 341	Chemical Process Control	3
CHE 381	Chemical Engineering Laboratory I	2
CHE 382	Chemical Engineering Laboratory II	2
CHE 396	Senior Design I	4
CHE 397	Senior Design II	4
CME 260	Properties of Materials	3
ECE 210	Electrical Circuit Analysis	3
CHE 499	Professional Development Seminar	0
CS 109	C/C++ Programming for Engineers with MatLab	3
Total Hours		49

<sup>a</sup> ENGR 100 is one-semester-hour course, but the hour does not count toward the total hours required for graduation.

## Technical Elective

Code	Title	Hours
<b>Courses</b>		
Select one of the following: <sup>a</sup>		3
CHE 392	Undergraduate Research <sup>b</sup>	
CHE 410	Transport Phenomena	
CHE 413	Introduction to Flow in Porous Media	
CHE 421	Combustion Engineering	
CHE 422	Biochemical Engineering	
CHE 423	Catalytic Reaction Engineering	

CHE 425	Nanotechnology for Pharmaceutical Applications	
CHE 431	Numerical Methods in Chemical Engineering	
CHE 433	Process Simulation With Aspen Plus	
CHE 438	Computational Molecular Modeling	
CHE 440	Non-Newtonian Fluids	
CHE 441	Computer Applications in Chemical Engineering	
CHE 445	Mathematical Methods In Chemical Engineering	
CHE 450	Air Pollution Engineering	
CHE 451	Renewable Energy Technologies	
CHE 456	Fundamentals and Design of Microelectronics Processes	
CHE 494	Selected Topics in Chemical Engineering <sup>c</sup>	
Total Hours		3

- a *Possible technical elective credit for a 400-level CHE course not listed above will require departmental approval by petition to the Undergraduate Committee.*
- b *An appropriate design-related research project may be selected with the approval of the Department of Chemical Engineering.*
- c *Current CHE 494 courses offered include: Electrochemistry, Entrepreneurship in Chemical Engineering, 2D Nanomaterials, Membranes, Nanotechnology and Bio-Nanotechnology, Polymer Materials*

## Electives outside the Major Rubric

Code	Title	Hours
<b>Electives</b>		
Electives outside the CHE rubric		3
Total Hours		3

## BS in Chemical Engineering, Biochemical Engineering Concentration

Students in this concentration complete the following:

Code	Title	Hours
<b>Required Courses<sup>a</sup></b>		
<b>Technical Elective</b>		
CHE 422	Biochemical Engineering	3
<b>Electives</b>		
Select two electives in nonmajor rubric category from the following:		5-7
BIOS 350	General Microbiology	
BIOS 351	Microbiology Laboratory	
CHEM 352	Introductory Biochemistry	
CHEM 452	Biochemistry I	
Total Hours		8-10

- a *Due to structure of the concentration and the prerequisites required for some of the courses, students in the concentration will be required to take a minimum of 130 semester hours for the degree.*

## Sample Course Schedule

Course	Title	Hours
<b>Freshman Year</b>		
<b>First Semester</b>		
ENGR 100	Engineering Orientation <sup>a</sup>	1
ENGL 160	Academic Writing I: Writing in Academic and Public Contexts	3
MATH 180	Calculus I	4
CHEM 122 & CHEM 123 or CHEM 116	General Chemistry I Lecture or Honors and Majors General and Analytical Chemistry I	5
General Education Core Course		3
Hours		15
<b>Second Semester</b>		
CS 109	C/C ++ Programming for Engineers with MatLab	3
MATH 181	Calculus II	4
PHYS 141	General Physics I (Mechanics)	4
CHEM 124 & CHEM 125 or CHEM 118	General Chemistry II Lecture or Honors and Majors General and Analytical Chemistry II	5
Hours		16
<b>Sophomore Year</b>		
<b>First Semester</b>		
ENGL 161	Academic Writing II: Writing for Inquiry and Research	3
PHYS 142	General Physics II (Electricity and Magnetism)	4
CHE 201	Introduction To Thermodynamics	3
MATH 210	Calculus III	3
CHEM 222	Analytical Chemistry	4
Hours		17
<b>Second Semester</b>		
CHE 205	Computational Methods in Chemical Engineering	3
CHE 210	Material and Energy Balances	4
MATH 220	Introduction to Differential Equations	3
CHEM 232	Organic Chemistry I	4
CHEM 342	Physical Chemistry I	3
Hours		17
<b>Junior Year</b>		
<b>First Semester</b>		
CHE 301	Chemical Engineering Thermodynamics	3
CHE 311	Transport Phenomena I	3
ECE 210	Electrical Circuit Analysis	3
CHEM 233	Organic Chemistry Laboratory I	2
CHEM 346	Physical Chemistry II	3
General Education Core Course		3
Hours		17
<b>Second Semester</b>		
CHE 312	Transport Phenomena II	3

CHE 313	Transport Phenomena III	3
CHE 321	Chemical Reaction Engineering	3
CHEM 234	Organic Chemistry II	4
CME 260	Properties of Materials	3
	Hours	16

**Senior Year****First Semester**

CHE 381	Chemical Engineering Laboratory I	2
CHE 396	Senior Design I	4
CHE 499	Professional Development Seminar	0
	General Education Core course	3
	General Education Core Course	3
	CHE Technical Elective	3
	Select one of the following:	
CHE 410	Transport Phenomena	
CHE 413	Introduction to Flow in Porous Media	
CHE 421	Combustion Engineering	
CHE 422	Biochemical Engineering	
CHE 423	Catalytic Reaction Engineering	
CHE 431	Numerical Methods in Chemical Engineering	
CHE 433	Process Simulation With Aspen Plus	
CHE 438	Computational Molecular Modeling	
CHE 440	Non-Newtonian Fluids	
CHE 441	Computer Applications in Chemical Engineering	
CHE 445	Mathematical Methods In Chemical Engineering	
CHE 450	Air Pollution Engineering	
CHE 456	Fundamentals and Design of Microelectronics Processes	
CHE 494	Selected Topics in Chemical Engineering	
CHE 392	Undergraduate Research (departmental approval is required for CHE 392)	
	Hours	15

**Second Semester**

CHE 341	Chemical Process Control	3
CHE 382	Chemical Engineering Laboratory II	2
CHE 397	Senior Design II	4
	Elective outside the Major Rubric	3
	General Education Core course	3
	Hours	15
	Total Hours	128

<sup>a</sup> ENGR 100 is a one-semester-hour course, but the hour does not count toward the total hours required for graduation.