CHEMICAL ENGINEERING (BS)

This program was approved for students entering the university in the Summer 2023–Spring 2024 catalog year. For more information about catalog year, go to Catalog Year Information (http://catalog.louisville.edu/undergraduate/university-wide-unit-specific-policies/catalog-year/).

Bachelor of Science in Chemical Engineering
Unit: Speed School of Engineering (https://engineering.louisville.edu)
Department: Chemical Engineering (https://engineering.louisville.edu/chemical/)
Academic Plan Code(s): CHE_BCH

Program Information

The Bachelor of Science in Chemical Engineering degree program is accredited by the Engineering Accreditation Commission (EAC) of ABET, www.abet.org (http://www.abet.org). The Master of Engineering in Chemical Engineering degree program is accredited by the Engineering Accreditation Commission (EAC) of ABET, www.abet.org (http://www.abet.org).

Degree Summary

Code	Title	Hours
General Education Requirements (http://catalog.louisville.edu/undergraduate/general-education-requirements/) [1]		31
	(19-22 hours of General Education requirements may be satisfied through coursework required by the degree program) [2]	
College/School Requirements [1]		35
Program/Major Requirements [1]		56
Supporting Courses		22
Minimum Total Hours		**123**

[1] Some courses required in this degree program satisfy multiple requirements. To complete the degree **in the minimum number of hours listed**, some hours from the General Education Requirements must be satisfied by courses defined by the unit and/or program. Using other courses to satisfy General Education requirements will require additional hours to complete the degree requirements. See the Degree Requirements and/or Track tabs for specific coursework.

[2] Any one course of PHIL 222, PHIL 225, PHIL 321, PHIL 323 or PHIL 328 satisfies the ChE Department Ethics Elective requirement. However, only PHIL 222 also counts for General Education content requirement in Arts and Humanities (AH).

Specific coursework information can be found on the Degree Requirements tab.

Incoming Student Admission Criteria

High School Curriculum Requirements: All schools require graduation from an accredited high school and completion of the Kentucky Pre-College Curriculum requirements. In addition, Speed School requires successful completion of the following courses in high school:

- Calculus or pre-calculus
- Chemistry

Students with ACT / SAT Scores

- ACT composite and math scores of 25 OR SAT combined CR+M score of 1200 and math score of 590. A 3.0 GPA on a 4.0 scale

OR

- ACT composite and math scores of 24 OR SAT combined CR+M score of 1160 and math score of 570. A 3.5 GPA on a 4.0 scale

Students without ACT / SAT Scores

- HS GPA of 3.0 (or better) on a 4.0 scale
- Comprehensive transcript evaluation
- Review of Student Resume

Transferring to Engineering BS degree programs

Students with 24 hours or more transferable semester hours will have a minimum college grade point average of 2.8 and at least B-minus grades in each of the following courses: ENGR 181 (or equivalent) and CHEM 101 (or equivalent).

It is recommended students successfully complete PHYS 298 (or equivalent) before transferring to the J.B. Speed School of Engineering.

General Education Requirements

Code	Title	Hours
General Education Requirements (http://catalog.louisville.edu/undergraduate/general-education-requirements/)		31
The following courses are required by the program and satisfy the respective General Education Requirement(s):		
CHEM 201	General Chemistry I - S (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	
CHEM 207	Introduction to Chemical Analysis I - SL (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	
COMM 111	Introduction to Public Speaking - OC (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	
or COMM 112	Business and Professional Speaking - OC (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	

	ENGL 101	Introduction to College Writing - WC (http://catalog.louisville.edu/undergraduate/general-education-requirements/)
	ENGL 102	Intermediate College Writing - WC (http://catalog.louisville.edu/undergraduate/general-education-requirements/)
	ENGR 101	Engineering Analysis I - QR (http://catalog.louisville.edu/undergraduate/general-education-requirements/)
	PHIL 222	Contemporary Moral Problems - AH (http://catalog.louisville.edu/undergraduate/general-education-requirements/) (optional, see note below) [6]
	PHYS 298	Introductory Mechanics, Heat and Sound - S (http://catalog.louisville.edu/undergraduate/general-education-requirements/)

All degrees require the completion of the University-wide General Education Program (link provided above). To complete the degree in the **minimum number of hours** listed on the Overview tab, some hours from the General Education Requirements must be satisfied by courses defined by the unit and/or program.

While any one course of PHIL 222, PHIL 225, PHIL 321, PHIL 323 or PHIL 328 satisfies the ChE Department Ethics Elective requirement, only PHIL 222 also counts for the General Education content requirement in Arts and Humanities (AH).

College/School Requirements

Code	Title	Hours
Speed School Core		
CHEM 201	General Chemistry I - S (http://catalog.louisville.edu/undergraduate/general-education-requirements/) [1]	3
CHEM 207	Introduction to Chemical Analysis I - SL (http://catalog.louisville.edu/undergraduate/general-education-requirements/) [1]	1
Select one of the following:		3
COMM 111	Introduction to Public Speaking - OC (http://catalog.louisville.edu/undergraduate/general-education-requirements/) [1]	
COMM 112	Business and Professional Speaking - OC (http://catalog.louisville.edu/undergraduate/general-education-requirements/) [1]	
ENGL 101	Introduction to College Writing - WC (http://catalog.louisville.edu/undergraduate/general-education-requirements/) [1,2]	3
ENGL 102	Intermediate College Writing - WC (http://catalog.louisville.edu/undergraduate/general-education-requirements/) [1,2]	3
ENGR 101	Engineering Analysis I - QR (http://catalog.louisville.edu/undergraduate/general-education-requirements/) [1]	4
ENGR 102	Engineering Analysis II	4
ENGR 110	Engineering Methods, Tools, and Practice I	2
ENGR 111	Engineering Methods, Tools and Practice II	2
ENGR 201	Engineering Analysis III	4
ENGR 205	Differential Equations for Engineering	2
PHYS 298	Introductory Mechanics, Heat and Sound - S (http://catalog.louisville.edu/undergraduate/general-education-requirements/) [1]	4
Minimum Total Hours		**35**

Program/Major Requirements

Code	Title	Hours
Chemical Engineering Department Requirements [3]		
CHE 205	Introduction to Chemical Engineering	3
CHE 211	Chemical Engineering Thermodynamics I	3
CHE 230	Computer Applications in Chemical Engineering	2
CHE 253	Materials Science	3
CHE 288	Chemical Engineering Cooperative Education Seminar	0
CHE 289	Chemical Engineering Cooperative Education I	1
CHE 305	Material and Energy Balances	4
CHE 312	Chemical Engineering Thermodynamics II	3
CHE 331	Principles of Fluid Dynamics	3
CHE 389	Chemical Engineering Cooperative Education II	1
CHE 401	Safety, Health and Environment	1
CHE 433	Principles of Heat and Mass Transfer	3
CHE 436	Separation Operations	4
CHE 441	Kinetics and Chemical Reactors	3
CHE 461	Elements of Process Control	3
CHE 471	The Strategy of Design	3
CHE 485	Unit Operations Laboratory I	2
CHE 486	Unit Operations Laboratory II	2
CHE 489	Chemical Engineering Cooperative Education III	1
CHE 520	Modeling and Transport Phenomena	3
CHE 572	Plant Process and Project Design - CUE (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	3
Chemical Engineering Core		
CHEM 202	General Chemistry II - S (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	3
CHEM 208	Introduction to Chemical Analysis II - SL (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	1
CHEM 209	Introduction to Chemical Analysis III	1
PHYS 295	Introductory Laboratories I - SL (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	1
Minimum Total Hours		**57**

Code	Title	Hours
Supporting Courses		
CHEM 341	Organic Chemistry I	3
CHEM 343	Organic Chemistry Laboratory I	2
IE 360	Probability and Statistics for Engineers	3
IE 370	Engineering Economic Analysis	3
ENGR 307	Numerical Methods for Engineering	2
Advanced Chemistry or Chemical Engineering Elective (see list below) [4, 5]		3

Advanced Science or Chemical Engineering Elective (see list below) [4, 5]	3
Ethics Elective [6]	3
Minimum Total Hours	**22**

Candidates for the Bachelor of Science degree must be in good standing (university GPA ≥ 2.25) and must attain a grade point average of at least 2.25 for all courses used to satisfy degree requirements.

Code	Title	Hours
Culminating Undergraduate Experience (Graduation requirement)		
Requirement fulfilled by completing:		
CHE 572	Plant Process and Project Design - CUE (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	

Advanced Chemistry or Chemical Engineering Electives

Select one course from the following list:

Code	Title	Hours
CHEM 342	Organic Chemistry II	3
CHEM 441	Elements of Physical Chemistry	3
CHEM 445	Survey of Biochemistry	3
CHEM 450	Introduction to Computational Chemistry and Molecular Modeling	3
CHEM 465	Physical Chemistry I	3
CHEM 466	Physical Chemistry II	3
CHEM 515	Inorganic Chemistry	3
CHEM 527	Spectroscopic Identification of Organic Compounds - WR (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	3
CHEM 545	Biochemistry I	3
CHEM 550	Group Theory and its Chemical Applications	3
CHEM 557	Bio-Organic Phenomena	3
CHE 300-level or higher non-required CHE course		

Advanced Science or Chemical Engineering Elective

Select one course from the following list:

Code	Title	Hours
BIOL 240	Unity of Life - S (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	3
BIOL 242	Diversity of Life - S (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	3
BIOL 257	Introduction to Microbiology - S (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	3
BIOL 329	Cellular and Molecular Biology	3
BIOL 330	Genetics and Molecular Biology	3
BIOL 350	Biostatistics	3
CHEM 342	Organic Chemistry II	3
CHEM 441	Elements of Physical Chemistry	3
CHEM 445	Survey of Biochemistry	3
CHEM 450	Introduction to Computational Chemistry and Molecular Modeling	3
CHEM 465	Physical Chemistry I	3
CHEM 466	Physical Chemistry II	3
CHEM 515	Inorganic Chemistry	3
CHEM 527	Spectroscopic Identification of Organic Compounds - WR (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	3
CHEM 545	Biochemistry I	3
CHEM 550	Group Theory and its Chemical Applications	3
CHEM 557	Bio-Organic Phenomena	3
ENVS 301	Geology for Scientists and Engineers	3
ENVS 360	Global Environmental Change	3
ENVS 363	Climate Science	3
ENVS 365	Biogeography	3
ENVS 564	Hydrology	3
PHYS 299	Introductory Electricity, Magnetism and Light	4
PHYS 300	Introductory Modern Physics	3
CHE 300-level or higher non-required CHE course		

1 This course is a General Education requirement for the program; see louisville.edu/provost/ger/ (http://www.louisville.edu/provost/ger/) for the listing, by academic year, of AH/D1/D2/SB/SBH Electives which satisfy the University-wide General Education requirements.

2 Students completing ENGL 105 in lieu of ENGL 101 or ENGL 102 satisfy the General Education and Engineering Fundamentals requirements for Written Communication. However, an additional 3-hr Writing (WR) course or honors Written Communication (WC) course may be needed to satisfy program credit hour requirements.

3 In order to meet departmental graduation requirements a student may accumulate no more than two D grades in CHE-prefixed courses. Any additional D grades beyond two must be repeated, in accordance with policies on course repetition. If a student accumulates more than one D in any one year of the program, it is strongly recommended that one or more of those courses be repeated to earn a better grade before proceeding to the next course in the sequence. For this policy, grades of D-minus, D or D+ are all considered to be D grades. Note also a student who accumulates more than one D in a ChE course will not be permitted to enter Graduate Studies to pursue the MEng degree program until any courses with D grades in excess of one are repeated and a better grade earned.

4 An undergraduate student must receive permission from the department chair in order to enroll in a 600-level course. The course chosen to fulfill this elective requirement cannot be used to satisfy any other program or degree requirements. Note that while some courses are acceptable as either Science or Advanced Chemistry Electives, a single course cannot be used to meet both requirements as the curriculum requires that these two electives constitute a combined total of six (6) credit hours.

5 The course chosen to fulfill this elective requirement cannot be used to satisfy other program or degree requirements. Note that while some courses are acceptable as either Science or Advanced Chemistry Electives, a single course cannot be used to meet both requirements as the curriculum requires that these two electives constitute a combined total of six (6) credit hours.

6 Any one course of PHIL 222, PHIL 225, PHIL 321, PHIL 323, or PHIL 328 satisfies the ChE Department Ethics Elective requirement. However, only PHIL 222 also counts for the General Education content requirement in Arts and Humanities (AH).

Flight Plan

Year 1		
Fall		**Hours**
CHEM 201	General Chemistry I - S (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	3
CHEM 207	Introduction to Chemical Analysis I - SL (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	1
CHEM 208	Introduction to Chemical Analysis II - SL (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	1
ENGL 101	Introduction to College Writing - WC (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	3
ENGR 101	Engineering Analysis I - QR (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	4
ENGR 110	Engineering Methods, Tools, and Practice I	2
General Education: Cardinal Core Arts & Humanities, Social & Behavioral Sciences, or Social & Behavioral Sciences Historical Persepective - AH, SB, or SBH		3
	Hours	**17**
Spring		
CHEM 202	General Chemistry II - S (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	3
CHEM 209	Introduction to Chemical Analysis III	1
ENGL 102	Intermediate College Writing - WC (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	3
ENGR 102	Engineering Analysis II	4
ENGR 111	Engineering Methods, Tools and Practice II	2
PHYS 295	Introductory Laboratories I - SL (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	1
PHYS 298	Introductory Mechanics, Heat and Sound - S (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	4
	Hours	**18**
Summer		
ENGR 201	Engineering Analysis III	4
CHE 205	Introduction to Chemical Engineering	3
CHE 230	Computer Applications in Chemical Engineering	2
CHE 253	Materials Science	3
	Hours	**12**
Year 2		
Fall		
CHE 211	Chemical Engineering Thermodynamics I	3
CHE 288	Chemical Engineering Cooperative Education Seminar	0
CHE 305	Material and Energy Balances	4
CHEM 341	Organic Chemistry I	3
CHEM 343	Organic Chemistry Laboratory I	2
ENGR 205	Differential Equations for Engineering	2
General Education: Cardinal Core Arts & Humanities, Social & Behavioral Sciences, or Social & Behavioral Sciences Historical Persepective Global Diversity - AHD2, SBD2, or SBHD2		3
	Hours	**17**
Spring		
CHE 289	Chemical Engineering Cooperative Education I	1
	Hours	**1**
Summer		
CHE 312	Chemical Engineering Thermodynamics II	3
CHE 331	Principles of Fluid Dynamics	3
CHE 401	Safety, Health and Environment	1
ENGR 307	Numerical Methods for Engineering	2
IE 360	Probability and Statistics for Engineers	3
	Hours	**12**
Year 3		
Fall		
CHE 389	Chemical Engineering Cooperative Education II	1
	Hours	**1**
Spring		
CHE 433	Principles of Heat and Mass Transfer	3
CHE 441	Kinetics and Chemical Reactors	3
Select one of the following:		3
COMM 111	Introduction to Public Speaking - OC (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	
COMM 112	Business and Professional Speaking - OC (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	
IE 370	Engineering Economic Analysis	3
General Education: Cardinal Core Arts & Humanities, Social & Behavioral Sciences, or Social & Behavioral Sciences Historical Persepective US Diversity - AHD1, SBD1, or SBHD1		3
	Hours	**15**
Summer		
CHE 489	Chemical Engineering Cooperative Education III	1
	Hours	**1**
Year 4		
Fall		
CHE 436	Separation Operations	4
CHE 471	The Strategy of Design	3
CHE 485	Unit Operations Laboratory I	2
Advanced Science or Chemical Engineering Elective		3
PHIL 222	Contemporary Moral Problems - AH (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	3
	Hours	**15**
Spring		
CHE 461	Elements of Process Control	3
CHE 486	Unit Operations Laboratory II	2
CHE 520	Modeling and Transport Phenomena	3
CHE 572	Plant Process and Project Design - CUE (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	3
Advanced Chemistry or Chemical Engineering Elective		3
	Hours	**14**
	Minimum Total Hours	**123**

Degree Audit Report

Degree Audit reports illustrate how your completed courses fulfill the requirements of your academic plan. What-if reports allow you to compare the courses you have completed in your current academic plan to the courses required in another academic plan. Should you have questions about either report, please consult with your academic advisor.

Flight Planner

The Flight Planner tool is available for you to create a personalized Flight Plan to graduation. Advisors have access to review your Flight Planner and can help you adjust it to ensure you remain on track to graduate in a timely manner.

To create these reports:

a. Log into your ULink account.
b. Click on the Academic Progress tile.
c. Select the appropriate report.

i. To run a Degree Audit report, click on "View my Degree Audit."
ii. To create a What-if report, click on "Create a What-if Advisement Report."
iii. To run a Flight Planner report, click on "Use My Flight Planner."

Click here to run a Degree Audit report, create a What-if report, or run a Flight Planner report. (https://ulink.louisville.edu)

The Bachelor of Science in Chemical Engineering (CHE BCH) program prepares students to meet the requirements for certification and/or licensure. If you plan to pursue professional licensure or certification you should first determine your state's criteria for examination and licensure to see how/if our program meets those requirements prior to enrollment. We recommend that you also contact your state's licensing board directly to verify that the requirements have not changed recently and to answer any questions especially those regarding additional requirements beyond the degree.

More information about certification or licensure is available at the following website: https://louisville.edu/oapa/licensure-information (https://louisville.edu/oapa/licensure-information/) (you may search by school or by the name of the program then click on 'View Details' to display the information).

For programs with an online option, more information about certification or licensure is available here: https://louisville.edu/online/About-Us?tab=disclosures (https://louisville.edu/online/About-Us/?tab=disclosures).