COMPUTER SCIENCE AND 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 Computer Science and Engineering
Unit: Speed School of Engineering (https://engineering.louisville.edu) (SS)
Department: Computer Science and Engineering (http://engineering.louisville.edu/computer/)
Academic Plan Code(s): CECSBCC

Program Information

The Bachelor of Science in Computer Science and Engineering degree program is accredited by the Engineering Accreditation Commission (EAC) and Computing Accreditation Commission (CAC) of ABET, www.abet.org (http://www.abet.org). The Master of Engineering in Computer Science and Engineering degree program is accredited by the Engineering Accreditation Commission 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 hours of General Education requirements may be satisfied through coursework required by the degree program)	
College/School Requirements [1]		35
Program/Major Requirements		59
Supporting Courses		17
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 Track tabs for specific coursework.

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 Intro to Chemistry (CHEM 101 or equivalent).

It is recommended students successfully complete Physics I (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/) [1]		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/) [3]	
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/)	
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.

College/School Requirements

Code	Title	Hours
Speed School Core		
CHEM 201	General Chemistry I - S (http://catalog.louisville.edu/undergraduate/general-education-requirements/) [2]	3
CHEM 207	Introduction to Chemical Analysis I - SL (http://catalog.louisville.edu/undergraduate/general-education-requirements/) [2]	1
COMM 111	Introduction to Public Speaking - OC (http://catalog.louisville.edu/undergraduate/general-education-requirements/) [2]	3
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/) [2,3]	3
ENGL 102	Intermediate College Writing - WC (http://catalog.louisville.edu/undergraduate/general-education-requirements/) [2,3]	3
ENGR 101	Engineering Analysis I - QR (http://catalog.louisville.edu/undergraduate/general-education-requirements/) [2]	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/) [2]	4
Minimum Total Hours		**35**

Program/Major Requirements

Code	Title	Hours
Computer Science and Engineering Department Requirements		
CSE 220	Object Oriented Program Design with Java	3
CSE 288	Computer Science and Engineering Cooperative Education Seminar	0
CSE 289	Computer Science and Engineering Cooperative Education I	1
CSE 302	Data Structures	3
CSE 310	Discrete Structures	3
CSE 311	Ethics, Social, and Legal Aspects on the Electronic Frontier	3
CSE 335	Introduction to Database	3
CSE 350	Introduction to Software Engineering	3
CSE 389	Computer Science and Engineering Cooperative Education II	1
CSE 412	Introduction to Embedded Systems	3
CSE 419	Introduction to Algorithms	3
CSE 420	Design of Operating Systems	3
CSE 489	Computer Science and Engineering Cooperative Education III	1
CSE 504	Automata Theory	3
CSE 516	Fundamentals of Computer Communications and Networks	3
CSE 525	Microcomputer Design	4
CSE 596	CSE Capstone Design - CUE (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	3
CSE Electives (see below) [4]		12
Computer Science and Engineering Core		
CSE 130	Introduction to C and C++ Programming Languages	3
PHYS 295	Introductory Laboratories I - SL (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	1
Minimum Total Hours		**59**

Code	Title	Hours
Supporting Courses		
ECE 210	Logic Design	3
ECE 211	Logic Design Laboratory	1
ECE 252	Introduction to Electrical Engineering	3
IE 360	Probability and Statistics for Engineers	3
PHYS 296	Introductory Laboratories II - SL (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	1
PHYS 299	Introductory Electricity, Magnetism and Light	4
ENGR 330	Linear Algebra for Engineering	2
Minimum Total Hours		**17**

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:		
CSE 596	CSE Capstone Design - CUE (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	3

Code	Title	Hours
Computer Science and Engineering Electives		
CSE 470	Mobile Device Programming	3
CSE 522	Performance Evaluation of Computer Systems	3
CSE 528	Game Design and Programming	3
CSE 530	Design of Compilers	3
CSE 532	Python and Data Analytics	3
CSE 538	Graph Database and Graph Analytics	3
CSE 545	Artificial Intelligence	3
CSE 546	Introduction to Machine Learning	3
CSE 547	Deep Learning Algorithms and Methods	3
CSE 564	Introduction to Cryptography	3

CSE 566	Information Security	3
CSE 568	Computer Forensics	3
CSE 590	Special Topics in Computer Science and Engineering	1-6
CSE 593	Independent Study in Computer Science and Engineering	1-6

[1] 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.

[2] 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.

[3] 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.

[4] The CSE Electives must be chosen from the approved list (above) or with departmental consent for additional CSE 5XX or 6XX courses.

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
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 US Diversity - AHD1, SBD1, or SBHD1		3
	Hours	**16**
Spring		
CSE 130	Introduction to C and C++ Programming Languages	3
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	**17**
Summer		
CSE 220	Object Oriented Program Design with Java	3
ENGR 201	Engineering Analysis III	4
PHYS 296	Introductory Laboratories II - SL (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	1
PHYS 299	Introductory Electricity, Magnetism and Light	4
	Hours	**12**

Year 2

Fall		
CSE 288	Computer Science and Engineering Cooperative Education Seminar	0
CSE 302	Data Structures	3
ECE 210	Logic Design	3
ECE 211	Logic Design Laboratory	1
CSE 335	Introduction to Database	3
ENGR 205	Differential Equations for Engineering	2
General Education: Cardinal Core Arts & Humanities, Social & Behavioral Sciences, or Social & Behavioral Sciences Historical Persepective US Diversity - AHD1, SBD1, or SBHD1		3
	Hours	**15**
Spring		
CSE 289	Computer Science and Engineering Cooperative Education I	1
	Hours	**1**
Summer		
CSE 310	Discrete Structures	3
COMM 111 or COMM 112	Introduction to Public Speaking - OC (http://catalog.louisville.edu/undergraduate/general-education-requirements/) or Business and Professional Speaking - OC (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	3
CSE 350	Introduction to Software Engineering	3
General Education: Cardinal Core Arts & Humanities, Social & Behavioral Sciences, or Social & Behavioral Sciences Historical Persepective - AH, SB, or SBH		3
	Hours	**12**

Year 3

Fall		
CSE 389	Computer Science and Engineering Cooperative Education II	1
	Hours	**1**
Spring		
CSE 311	Ethics, Social, and Legal Aspects on the Electronic Frontier	3
CSE 412 or ECE 412	Introduction to Embedded Systems or Introduction to Embedded Systems	3
CSE 419	Introduction to Algorithms	3
ENGR 330	Linear Algebra for Engineering	2
IE 360	Probability and Statistics for Engineers	3
ECE 252	Introduction to Electrical Engineering	3
	Hours	**17**
Summer		
CSE 489	Computer Science and Engineering Cooperative Education III	1
	Hours	**1**

Year 4

Fall		
CSE 420	Design of Operating Systems	3
CSE 504	Automata Theory	3
CSE 525	Microcomputer Design	4
CSE Elective		3
CSE Elective		3
	Hours	**16**
Spring		
CSE 516	Fundamentals of Computer Communications and Networks	3
General Education: Cardinal Core Arts & Humanities, Social & Behavioral Sciences, or Social & Behavioral Sciences Historical Persepective - AH, SB, or SBH		3

CSE Elective		3
CSE Elective		3
CSE 596	CSE Capstone Design - CUE (http://catalog.louisville.edu/undergraduate/general-education-requirements/)	3
	Hours	**15**
	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 Computer Science and Engineering (CECSBCC) 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: 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: louisville.edu/online/About-Us (http://louisville.edu/online/About-Us/) (please scroll down near the bottom of the page and click on the licensing disclosures tab).