

# COMPUTER ENGINEERING AND COMPUTER SCIENCE (BS)

This program was approved for students entering the university in the Summer 2019–Spring 2020 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 Engineering and Computer Science**  
Unit: Speed School of Engineering (SS) (<http://louisville.edu/speed>)  
Department: Computer Engineering and Computer Science (<http://louisville.edu/speed/computer>)  
Academic Plan Code(s): CECSBCC

## Program Information

Students specializing in Computer Engineering and Computer Science will complete a program consisting of two semesters in Engineering Fundamentals and a further period of study in the Department of Computer Engineering and Computer Science - nine semesters in Departmental Studies to complete the Bachelor of Science degree, followed by a fifth year in Graduate Studies for the Master of Engineering degree. This curriculum includes a cooperative education component.

The Bachelor of Science in Computer Engineering and Computer Science degree program is accredited by the Engineering Accreditation Commission (EAC) and Computing Accreditation Commission (CAC) of ABET, [www.abet.org](http://www.abet.org) (<http://www.abet.org>). The Master of Engineering in Computer Engineering and Computer Science degree program is accredited by the Engineering Accreditation Commission of ABET, [www.abet.org](http://www.abet.org) (<http://www.abet.org>).

## Degree Summary

Code	Title	Hours
	General Education Requirements ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements">http://catalog.louisville.edu/undergraduate/general-education-requirements</a> ) <sup>1</sup>	31
	(22 hours of General Education requirements may be satisfied through coursework required by the degree program)	
	College/School Requirements <sup>1</sup>	40
	Program/Major Requirements	74
	Minimum Total Hours	123

<sup>1</sup> 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.

## Departmental Admission Requirements

Acceptance into a Department requires that a student have a 2.25 GPA in the prescribed set of courses totaling 30 semester hours in

Engineering Fundamentals. In addition, the student must be in good standing (university GPA  $\geq 2.25$ ).

## General Education Requirements

Code	Title	Hours
	General Education Requirements ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements">http://catalog.louisville.edu/undergraduate/general-education-requirements</a> ) <sup>1</sup>	31
The following courses are required by the program and satisfy the respective General Education Requirement(s):		
CHEM 201	General Chemistry I - S	
CHEM 207	Introduction to Chemical Analysis I - SL	
COMM 111	Introduction to Public Speaking - OC or COMM 112 Business and Professional Speaking - OC	
ENGL 101	Introduction to College Writing - WC <sup>3</sup>	
ENGL 102	Intermediate College Writing - WC	
ENGR 101	Engineering Analysis I - QR	
PHYS 298	Introductory Mechanics, Heat and Sound - S	

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
<b>Speed School Core</b>		
CHEM 201	General Chemistry I - S <sup>2</sup>	3
CHEM 207	Introduction to Chemical Analysis I - SL <sup>2</sup>	1
COMM 111	Introduction to Public Speaking - OC <sup>2</sup> or COMM 112 Business and Professional Speaking - OC	3
ENGL 101	Introduction to College Writing - WC <sup>2,3</sup>	3
ENGL 102	Intermediate College Writing - WC <sup>2,3</sup>	3
ENGR 101	Engineering Analysis I - QR <sup>2</sup>	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
PHYS 298	Introductory Mechanics, Heat and Sound - S <sup>2</sup>	4
<b>Engineering Fundamentals<sup>4</sup></b>		
ENGR 201	Engineering Analysis III	4
ENGR 205	Differential Equations for Engineering	2
ENGR 330	Linear Algebra for Engineering	2
	Minimum Total Hours	37

## Program/Major Requirements

Code	Title	Hours
<b>Computer Engineering and Computer Science Department Requirements</b>		
CECS 220	Object Oriented Program Design with Java	3
CECS 288	Computer Engineering and Computer Science Cooperative Education Seminar	0
CECS 289	Computer Engineering and Computer Science Cooperative Education I	1
CECS 302	Data Structures	3

CECS 310	Discrete Structures	3
CECS 311	Ethics, Social, and Legal Aspects on the Electronic Frontier	3
CECS 389	Computer Engineering and Computer Science Cooperative Education II	1
CECS/ECE 412	Introduction to Embedded Systems	3
CECS 419	Introduction to Algorithms	3
CECS 420	Design of Operating Systems	3
CECS 489	Computer Engineering and Computer Science Cooperative Education III	1
CECS 504	Automata Theory	3
CECS 516	Fundamentals of Computer Communications and Networks	3
CECS 525	Microcomputer Design	4
CECS 535	Introduction to Databases	3
CECS 550	Software Engineering	3
CECS 596	CECS Capstone Design - CUE (CUE)	3
CECS Electives (see below) <sup>5</sup>		9
<b>Computer Engineering and Computer Science Core</b>		
CECS 130	Introduction to Programming Languages	3
PHYS 295	Introductory Laboratories I - SL	1
<b>Supporting Courses</b>		
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
IE 370	Engineering Economic Analysis	3
PHYS 296	Introductory Laboratories II - SL	1
PHYS 299	Introductory Electricity, Magnetism and Light	4
Minimum Total Hours		74

Candidates for the Bachelor of Science degree must be in good standing (university GPA  $\geq$  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:  
CECS 596 CECS Capstone Design - CUE

**CECS Electives**

Code	Title	Hours
CECS 522	Performance Evaluation of Computer Systems	3
CECS 542	Computer Control and Real Time Programming	3
CECS 545	Artificial Intelligence	3
CECS 564	Introduction to Cryptography	3
CECS 568	Computer Forensics	3

<sup>1</sup> 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.

<sup>2</sup> This course is a General Education requirement for the program; see 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.

<sup>3</sup> 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 is needed to satisfy program credit hour requirements. A current list of acceptable WC courses is at louisville.edu/speed/academics/policies/english-105.

<sup>4</sup> Acceptance into a Department requires that a student have a 2.25 GPA in the prescribed set of courses totaling 30 semester hours in Engineering Fundamentals. In addition, the student must be in good standing with the university (university GPA  $\geq$  2.25).

<sup>5</sup> The CECS Electives must be chosen from the approved list (above) or with departmental consent for additional CECS 5XX or 6XX courses.

## Flight Plan

Course	Title	Hours
<b>Year 1</b>		
<b>Fall</b>		
CHEM 201	General Chemistry I - S	3
CHEM 207	Introduction to Chemical Analysis I - SL	1
ENGL 101	Introduction to College Writing - WC	3
ENGR 101	Engineering Analysis I - QR	4
ENGR 110	Engineering Methods, Tools, and Practice I	2
General Education: Cardinal Core Arts & Humanities, Social & Behavioral Sciences, or Social & Behavioral Sciences Historical Perspective US Diversity - AHD1, SBD1, or SBHD1		3
Hours		16
<b>Spring</b>		
CECS 130	Introduction to Programming Languages	3
ENGL 102	Intermediate College Writing - WC	3
ENGR 102	Engineering Analysis II	4
ENGR 111	Engineering Methods, Tools and Practice II	2
PHYS 295	Introductory Laboratories I - SL	1
PHYS 298	Introductory Mechanics, Heat and Sound - S	4
Hours		17
<b>Summer</b>		
CECS 220	Object Oriented Program Design with Java	3
ENGR 201	Engineering Analysis III	4
PHYS 296	Introductory Laboratories II - SL	1
PHYS 299	Introductory Electricity, Magnetism and Light	4
Hours		12
<b>Year 2</b>		
<b>Fall</b>		
CECS 288	Computer Engineering and Computer Science Cooperative Education Seminar	0
CECS 302	Data Structures	3
ECE 210	Logic Design	3
ECE 211	Logic Design Laboratory	1
ECE 252	Introduction to Electrical Engineering	3
ENGR 205	Differential Equations for Engineering	2
General Education: Cardinal Core Arts & Humanities, Social & Behavioral Sciences, or Social & Behavioral Sciences Historical Perspective - AH, SB, or SBH		3
Hours		15

<b>Spring</b>		
CECS 289	Computer Engineering and Computer Science Cooperative Education I	1
Hours		1
<b>Summer</b>		
CECS 310	Discrete Structures	3
COMM 111	Introduction to Public Speaking - OC	3
or COMM 112	or Business and Professional Speaking - OC	
General Education: Cardinal Core Arts & Humanities, Social & Behavioral Sciences, or Social & Behavioral Sciences Historical Perspective - AH, SB, or SBH		3
General Education: Cardinal Core Arts & Humanities, Social & Behavioral Sciences, or Social & Behavioral Sciences Historical Perspective - AH, SB, or SBH		3
Hours		12
<b>Year 3</b>		
<b>Fall</b>		
CECS 389	Computer Engineering and Computer Science Cooperative Education II	1
Hours		1
<b>Spring</b>		
CECS 311	Ethics, Social, and Legal Aspects on the Electronic Frontier	3
CECS 412	Introduction to Embedded Systems	3
or ECE 412	or Introduction to Embedded Systems	
CECS 419	Introduction to Algorithms	3
ENGR 330	Linear Algebra for Engineering	2
IE 360	Probability and Statistics for Engineers	3
IE 370	Engineering Economic Analysis	3
Hours		17
<b>Summer</b>		
CECS 489	Computer Engineering and Computer Science Cooperative Education III	1
Hours		1
<b>Year 4</b>		
<b>Fall</b>		
CECS 420	Design of Operating Systems	3
CECS 504	Automata Theory	3
CECS 525	Microcomputer Design	4
CECS 535	Introduction to Databases (CECS Elective)	3
CECS Elective		3
Hours		16
<b>Spring</b>		
CECS 516	Fundamentals of Computer Communications and Networks	3
CECS 550	Software Engineering	3
CECS 596	CECS Capstone Design - CUE	3
CECS Elective		3
CECS Elective		3
Hours		15
Minimum Total Hours		123

- Next, click on "View my Academic Advisement Report" to run a Degree Audit report in the Undergraduate Advising area.
- To create a What-if report, click on "Create a What-if Advisement Report."

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

### Flight Planner

Based on your major, the Flight Planner tool may be available for you to create a personalized Flight Plan. The Flight Planner can be found in the ULink Student Center. Consult with your advisor for assistance with the Flight Planner.

### 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.

#### To create either report:

- Log into your ULink account.
- Click on the Student Services tab.