

# COMPUTER SCIENCE (BA)



This program was approved for students entering the university in the Fall 2021 semester.

## Bachelor of Arts in Computer Science

Unit: Speed School of Engineering (<https://engineering.louisville.edu/>) (SS)

Department: Computer Science and Engineering (<http://engineering.louisville.edu/computer/>)

Academic Plan Code(s): CS BA

## Program Information

The Bachelor of Arts in Computer Science provides students with a solid foundation and skills in computer science while allowing students to choose other areas of studies that are not necessarily tied to sciences or engineering applications of computer science.

## 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
	(12 hours of General Education requirements may be satisfied through coursework required by the degree program)	
	College/School Requirements <sup>1</sup>	12
	Program/Major Requirements	60
	Supporting Courses	30
	<b>Minimum Total Hours</b>	<b>121</b>

<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 program.

### 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, this program requires successful completion of either Calculus or Pre-calculus in high school.

### 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 BA 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 College Algebra (MATH 111 or equivalent).

## 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 to satisfy the respective General Education Requirement(s):

COMM 111	Introduction to Public Speaking - OC ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )
or COMM 112	Business and Professional Speaking - OC ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )
ENGL 101	Introduction to College Writing - WC ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> ) <sup>3</sup>
ENGL 102	Intermediate College Writing - WC ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> ) <sup>3</sup>
MATH 180	Elements of Calculus - QR ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )

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>		
COMM 111	Introduction to Public Speaking - OC ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> ) <sup>2</sup>	3
or COMM 112	Business and Professional Speaking - OC ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	
ENGL 101	Introduction to College Writing - WC ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> ) <sup>2,3</sup>	3
ENGL 102	Intermediate College Writing - WC ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> ) <sup>2,3</sup>	3
MATH 180	Elements of Calculus - QR ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> ) <sup>2</sup>	3
<b>Minimum Total Hours</b>		<b>12</b>

## Program/Major Requirements

Code	Title	Hours
<b>Computer Science Requirements</b>		
CSE 101	Bachelor of Arts in Computer Science Campus Culture Experience	1
CSE 120	Introduction to Programming with Python	3
CSE 110	Mathematical Foundations for Computer Science	3
CSE 130	Introduction to C and C++ Programming Languages	3
CSE 220	Object Oriented Program Design with Java	3
CSE 235	Computer Systems and Organization	3
CSE 302	Data Structures	3
CSE 310	Discrete Structures	3
CSE 335	Introduction to Database	3
CSE 298	Internship Education Seminar (BACS)	0
CSE 299	Internship I	1
CSE 350	Introduction to Software Engineering	3
CSE 419	Introduction to Algorithms	3
CSE 420	Design of Operating Systems	3
CSE 399	Internship II	1
CSE 470	Mobile Device Programming	3
CSE 496	BACS Capstone Design - CUE ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	3
CSE Electives (see below) <sup>4</sup>		12
CSE Electives <sup>4</sup> or Other Area of Study Electives		6
<b>Minimum Total Hours</b>		<b>60</b>
<b>Supporting Courses</b>		
Other Area of Study (Minor Preferred) <sup>5,6</sup>		30
<b>Minimum Total Hours</b>		<b>30</b>

Candidates for the Bachelor of Arts 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.

At least 52 of the total minimum hours required must be at the 300 level or above.

Code	Title	Hours
<b>Culminating Undergraduate Experience (Graduation requirement)</b>		

Requirement fulfilled by completing:

CSE 496	BACS Capstone Design - CUE ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	3
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Code	Title	Hours
<b>Computer Science Electives</b>		

CSE 504	Automata Theory	3
CSE 516	Fundamentals of Computer Communications and Networks	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

<sup>1</sup> To complete the degree in the minimum number of hours listed, some hours from the General Education Requirement 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/](http://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.

<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 may be needed to satisfy program credit hour requirements.

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

<sup>5</sup> Transfer classes that are only offered on a pass/fail basis may be considered to meet Other Areas of Study (OAS) requirements only.

<sup>6</sup> Students completing a track may complete the requirements with these hours. See Track Requirements tab.

**Artificial Intelligence Track**

Academic Plan Code: CS\_\_BA\_ART

Code	Title	Hours
CSE 532	Python and Data Analytics	3
CSE 545	Artificial Intelligence	3
CSE 546	Introduction to Machine Learning	3
CSE 547	Deep Learning Algorithms and Methods	3
CSE 496	BACS Capstone Design - CUE	3
<b>Minimum Total Hours</b>		<b>15</b>

**Data Science Track**

Academic Plan Code: CS\_\_BA\_DAS

Code	Title	Hours
MATH 360	Statistical Data Analysis - WR	3
CSE 532	Python and Data Analytics	3
CSE 538	Graph Database and Graph Analytics	3
CSE 546	Introduction to Machine Learning	3
CSE 551	Data Visualization for Data Science	3
<b>Minimum Total Hours</b>		<b>15</b>

**Cybersecurity Track**

Academic Plan Code: CS\_\_BA\_CYB

Code	Title	Hours
CSE 566	Information Security	3
or CIS 481	Introduction to Information Security	
CSE 568	Computer Forensics	3
or CIS 484	Computer Forensics	
or CSE 564	Introduction to Cryptography	
CIS 480	Introduction to Network Security	3
CIS 483	Introduction to Database Security	3
CSE 496	BACS Capstone Design - CUE	3
<b>Minimum Total Hours</b>		<b>15</b>

**NOTE: Students completing the Cybersecurity track are encouraged to also complete the additional courses below towards any remaining CSE Electives and/or OAS hours.**

Code	Title	Hours
CJ 200	Crime and Justice in the United States - SB	3
CJ 305	Criminal Behavior	3
CJ 306	Criminal Procedure	3
CJ 395	Criminal Law and Evidence	3

<b>Year 1</b>		
<b>Fall</b>		
ENGL 101	Introduction to College Writing - WC ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	3
CSE 101	Bachelor of Arts in Computer Science Campus Culture Experience	1
CSE 120	Introduction to Programming with Python	3
MATH 180	Elements of Calculus - QR ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	3
General Education Requirement		3

Other Areas of Studies		3
<b>Hours</b>		<b>16</b>
<b>Spring</b>		
ENGL 102	Intermediate College Writing - WC ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	3
CSE 110	Mathematical Foundations for Computer Science	3
CSE 130	Introduction to C and C++ Programming Languages	3
General Education Requirement (Science w/Lab)		4
Other Areas of Studies		3
<b>Hours</b>		<b>16</b>
<b>Year 2</b>		
<b>Fall</b>		
CSE 220	Object Oriented Program Design with Java	3
CSE 235	Computer Systems and Organization	3
CSE 298	Internship Education Seminar (BACS)	0
Other Areas of Studies		3
Other Areas of Studies		3
General Education Requirement		3
<b>Hours</b>		<b>15</b>
<b>Spring</b>		
CSE 302	Data Structures	3
CSE 310	Discrete Structures	3
CSE 335	Introduction to Database	3
COMM 111 or COMM 112	Introduction to Public Speaking - OC ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> ) or Business and Professional Speaking - OC ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	3
<b>Hours</b>		<b>12</b>
<b>Summer</b>		
CSE 299	Internship I	1
<b>Hours</b>		<b>1</b>
<b>Year 3</b>		
<b>Fall</b>		
CSE 350	Introduction to Software Engineering	3
CSE 419	Introduction to Algorithms	3
Other Areas of Studies		3
Other Areas of Studies		3
General Education Requirement		3
<b>Hours</b>		<b>15</b>
<b>Spring</b>		
CSE 420	Design of Operating Systems	3
CSE 470	Mobile Device Programming	3
CSE 3xx+ Elective		3
Other Areas of Studies (300+)		3
Other Areas of Studies		3
<b>Hours</b>		<b>15</b>
<b>Summer</b>		
CSE 399	Internship II	1
<b>Hours</b>		<b>1</b>
<b>Year 4</b>		
<b>Fall</b>		
CSE 3xx+ Elective		3
CSE 3xx+ Elective		3
CSE Elective or Other Area of Studies (300+)		3
Other Area of Studies (300+)		3
General Education Requirement		3
<b>Hours</b>		<b>15</b>

**Spring**

CSE 496	BACS Capstone Design - CUE ( <a href="http://catalog.louisville.edu/undergraduate/general-education-requirements/">http://catalog.louisville.edu/undergraduate/general-education-requirements/</a> )	3
CSE 3xx+ Elective		3
CSE Elective or Other Area of Studies (300+)		3
Other Area of Studies (300+)		3
General Education Requirement		3
<b>Hours</b>		<b>15</b>
<b>Minimum Total Hours</b>		<b>121</b>