

# COMPUTER SCIENCE, B.S.

The Department of Computer Science at Saint Louis University offers both a Bachelor of Arts and a Bachelor of Science in Computer Science. The B.S. is designed for students who want a greater technical depth of study. It can be paired with other science, mathematics and engineering programs at SLU.

SLU's accelerated master's program allows undergraduate computer science majors to earn both a bachelor's degree and a master's degree in five years. Students combine a B.A. or B.S. in computer science with a master's degree in computer science, software engineering, artificial intelligence or bioinformatics and computational biology.

Computer science is an exciting, rapidly developing field with vast influence on modern society. Computer science encompasses a broad range of theories and applications. Due to the emphasis on problem-solving skills, computer science is an excellent major for students going into many fields, including technology, business, medicine and law.

## Program Highlights

- A choice of engaging introductory courses allows students to better connect the application of computer science to their interests.
- Courses are taught in computer labs to allow for hands-on learning; small class sizes allow for rich student-faculty interactions.
- A curriculum that allows students to see the impact and application of computing throughout society.

## Curriculum Overview

Students completing the Bachelor of Science curriculum in computer science obtain a technically rigorous and comprehensive degree modeled upon recommendations of the ABET Computing Accreditation Commission. The Bachelor of Science degree also requires 11 credits of science/engineering, including one sequence of two lab courses.

## Fieldwork and Research Opportunities

SLU's location in the Midtown area of St. Louis provides students access to a robust technology community with operations for many Fortune 500 companies and a vibrant start-up culture. This environment provides outstanding opportunities for summer internships, part-time work during the academic year and jobs after graduation.

Our campus is within walking distance of the Cortex Innovation Community (<https://www.cortexstl.org/>), a 200-acre (and growing) innovation hub and technology district. Cortex houses SLU's Research Innovation Group (<https://www.slu.edu/research/faculty-resources/research-innovation-group/>), which works on technology transfer and commercial partnerships. Cortex is also home to the weekly Venture Cafe (every Thursday from 3-8 p.m.), which is a great place for students to connect with members of the tech community in a friendly and informal setting. Also in downtown St. Louis is the T-REX Technology Entrepreneur Center, a coworking space and technology incubator.

Our faculty integrate students into their research programs in a variety of ways. Some of our undergraduate students have participated in research experience for undergraduates (REUs), capstone projects and independent research that has resulted in scholarly publications with their faculty mentors. Many students have had opportunities to travel to conferences and present their work.

## Careers

Careers related to computer science are routinely found on various "best jobs" lists because of their outstanding combination of excellent pay, satisfying work-life balance and personal reward in seeing the great impact of computing throughout society. As a sample of such listings:

- U.S. News 100 Best Jobs list for 2024 (<https://money.usnews.com/careers/best-jobs/rankings/the-100-best-jobs/>) The top 100 included software developer (#3), IT manager (#4), information security analyst (#7), data scientist (#8), web developer (#21), computer systems analyst (#61), and computer network architect (#77).
- Glassdoor's 50 Best Jobs in America list for 2022 ([https://www.glassdoor.com/List/Best-Jobs-in-America-LST\\_KQ0,20.htm](https://www.glassdoor.com/List/Best-Jobs-in-America-LST_KQ0,20.htm)) named enterprise architect as #1, and many other technology positions appear within the top 25: full stack engineer (#2), data scientist (#3), devops engineer (#4), machine learning engineer (#6), data engineer (#8), software engineer (#8), java developer (#9), back end engineer (#11), cloud engineer (#12) information security engineer (#15), back end engineer (#16), automation engineer (#21), and UX designer (#24).

## Admission Requirements

### Begin Your Application (<http://www.slu.edu/apply.php>)

Saint Louis University also accepts the Common Application.

### Freshman

All applications are thoroughly reviewed with the highest degree of individual care and consideration to all credentials that are submitted. Solid academic performance in college preparatory coursework is a primary concern in reviewing a freshman applicant's file.

To be considered for admission to any Saint Louis University undergraduate program, applicants must be graduating from an accredited high school, have an acceptable HiSET exam score or take the General Education Development (GED) test.

### Transfer

Applicants must be a graduate of an accredited high school or have an acceptable score on the GED.

Students who have attempted fewer than 24 semester credits (or 30 quarter credits) of college credit must follow the above freshmen admission requirements. Students who have completed 24 or more semester credits (or 30 quarter credits) of college credit must submit transcripts from all previously attended college(s).

In reviewing a transfer applicant's file, the Office of Admission holistically examines the student's academic performance in college-level coursework as an indicator of the student's ability to meet the academic rigors of Saint Louis University. Where applicable, transfer students will be evaluated on any courses outlined in the continuation standards of their preferred major.

## International Applicants

All admission policies and requirements for domestic students apply to international students along with the following:

- Demonstrate English Language Proficiency (<https://catalog.slu.edu/academic-policies/office-admission/undergraduate/english-language-proficiency/>)
- Proof of financial support must include:

- A letter of financial support from the person(s) or sponsoring agency funding the time at Saint Louis University
- A letter from the sponsor's bank verifying that the funds are available and will be so for the duration of study at the University
- Academic records, in English translation, of students who have undertaken postsecondary studies outside the United States must include the courses taken and/or lectures attended, practical laboratory work, the maximum and minimum grades attainable, the grades earned or the results of all end-of-term examinations, and any honors or degrees received. WES and ECE transcripts are accepted.

## Tuition

Tuition	Cost Per Year
Undergraduate Tuition	\$54,760

Additional charges may apply. Other resources are listed below:

Net Price Calculator (<https://www.slu.edu/financial-aid/tuition-and-costs/calculator.php>)

Information on Tuition and Fees (<https://catalog.slu.edu/academic-policies/student-financial-services/tuition/>)

Miscellaneous Fees (<https://catalog.slu.edu/academic-policies/student-financial-services/fees/>)

Information on Summer Tuition (<https://catalog.slu.edu/academic-policies/student-financial-services/tuition-summer/>)

## Scholarships and Financial Aid

There are two principal ways to help finance a Saint Louis University education:

- **Scholarships:** Scholarships are awarded based on academic achievement, service, leadership and financial need.
- **Financial Aid:** Financial aid is provided through grants and loans, some of which require repayment.

Saint Louis University makes every effort to keep our education affordable. In fiscal year 2023, 99% of first-time freshmen and 92% of all students received financial aid (<https://www.slu.edu/financial-aid/>) and students received more than \$459 million in aid University-wide.

For priority consideration for merit-based scholarships, apply for admission by December 1 and complete a Free Application for Federal Student Aid (FAFSA) by March 1.

For information on other scholarships and financial aid, visit [www.slu.edu/financial-aid](http://www.slu.edu/financial-aid) (<https://www.slu.edu/financial-aid/>).

## Learning Outcomes

1. Graduates will be able to analyze a complex computing problem and apply principles of computing and other relevant disciplines to identify solutions.
2. Graduates will be able to design, implement, evaluate and test a software system that meets a given set of computing requirements.
3. Graduates will be able to apply computer science theory, knowledge of computer systems and software development fundamentals to produce computing-based solutions.
4. Graduates will be able to communicate effectively to both professional and general audiences in both oral and written forms.

5. Graduates will be able to recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
6. Graduates will be able to function effectively as members of a team in developing computing technology and solving technical problems.

## Requirements

Computer science students must complete a minimum total of 76 credits for the major.

Code	Title	Credits
<b>University Undergraduate Core</b> ( <a href="https://catalog.slu.edu/academic-policies/academic-policies-procedures/university-core/">https://catalog.slu.edu/academic-policies/academic-policies-procedures/university-core/</a> )		
<b>Major Requirements</b>		
Select a CSCI 10xx: Introduction to Computer Science (p. 3)		3
CSCI 1300	Introduction to Object-Oriented Programming	4
CSCI 2100	Data Structures	4
CSCI 2300	Object-Oriented Software Design	3
CSCI 2500	Computer Organization and Systems	3
CSCI 2510	Principles of Computing Systems	3
CSCI 3100	Algorithms	3
CSCI 3200	Programming Languages	3
CSCI 3300	Software Engineering	3
CSCI 4961	Capstone Project I	2
CSCI 4962	Capstone Project II	2
Select a Systems Elective Course (p. 3)		3
Two additional 3000 or 4000 level CSCI elective courses		6
<b>Required Mathematics Courses</b>		
MATH 1510	Calculus I	4
MATH 1520	Calculus II	4
MATH 1660	Discrete Mathematics	3
STAT 3850	Foundation of Statistics	3
Additional MATH or STAT courses at the 2000 level or above		6
<b>Required Computer Ethics</b>		
PHIL 3050X	Computer Ethics	3
<b>Required Science/Engineering Courses</b>		
Select 8 credit sequence in a single lab science.		8
An additional 3 credits of any science/engineering course, excluding courses in the CSCI subject code.		3
<b>General Electives</b>		<b>24-27</b>
<b>Total Credits</b>		<b>123</b>

## Non-Course Requirements

All Science and Engineering B.A. and B.S. students must complete an exit interview/survey near the end of their bachelor's program.

## Continuation Standards

After declaring a computer science major, students must achieve a minimum GPA of 2.00 in computer science courses by the conclusion of their second year as a major and maintain such a GPA at the conclusion of each semester thereafter. Furthermore, students should require at most two attempts to successfully complete any computer science courses required for the major (where an unsuccessful attempt is

considered a "D" or "F" for courses numbered 2100 and lower, and an "F" in higher-level courses).

Students are also expected to make adequate progress in the major, typically by enrolling in at least one computer science course per semester until completing their coursework (with exceptions made for premed scholars during their first year, and all students if studying abroad or facing other such extenuating circumstances).

## Program Notes

At most three credit hours of internship with industry courses can be applied to the degree.

## Introduction to Computer Science

Code	Title	Credits
CSCI 1010	Introduction to Computer Science: Principles	
CSCI 1020	Introduction to Computer Science: Bioinformatics	
CSCI 1025	Introduction to Computer Science: Cybersecurity	
CSCI 1030	Introduction to Computer Science: Game Design	
CSCI 1040	Introduction to Computer Science: Mobile Computing	
CSCI 1050	Introduction to Computer Science: Multimedia	
CSCI 1060	Introduction to Computer Science: Scientific Programming	
CSCI 1070	Introduction to Computer Science: Taming Big Data	
CSCI 1080	Introduction to Computer Science: World Wide Web	
CSCI 1090	Introduction to Computer Science: Special Topics	

With permission, a computing-intensive course from another discipline may be substituted. Examples of such courses include:

BME 2000	Biomedical Engineering Computing
CVNG 1500	Civil Engineering Computing
STAT 3850	Foundation of Statistics

## Systems Electives Courses

Code	Title	Credits
CSCI 4500	Advanced Operating Systems	
CSCI 4530	Computer Security	
CSCI 4550	Computer Networks	
CSCI 4610	Concurrent and Parallel Programming	
CSCI 4620	Distributed Computing	

## Roadmap

Roadmaps are recommended semester-by-semester plans of study for programs and assume full-time enrollment unless otherwise noted.

Courses and milestones designated as critical (marked with !) must be completed in the semester listed to ensure a timely graduation. Transfer credit may change the roadmap.

This roadmap should not be used in the place of regular academic advising appointments. All students are encouraged to meet with their advisor/mentor each semester. Requirements, course availability and sequencing are subject to change.

Course	Title	Credits
<b>Year One</b>		
<b>Fall</b>		
CSCI 10xx	Introduction to Computer Science (p. 4)	3
MATH 1510	Calculus I	4
University Core and/or General Electives		9
<b>Credits</b>		<b>16</b>
<b>Spring</b>		
CSCI 1300	Introduction to Object-Oriented Programming	4
MATH 1520	Calculus II	4
University Core and/or General Electives		6
<b>Credits</b>		<b>14</b>
<b>Year Two</b>		
<b>Fall</b>		
CSCI 2100	Data Structures	4
CSCI 2500	Computer Organization and Systems	3
MATH 1660	Discrete Mathematics	3
Science I with lab		4
PHIL 3050X	Computer Ethics	3
<b>Credits</b>		<b>17</b>
<b>Spring</b>		
CSCI 2300	Object-Oriented Software Design	3
CSCI 2510	Principles of Computing Systems	3
MATH 3850	Foundation of Statistics	3
Science II with lab ‡		4
University Core and/or General Electives		2
<b>Credits</b>		<b>15</b>
<b>Year Three</b>		
<b>Fall</b>		
CSCI 3100	Algorithms	3
Systems Elective Course (p. 4)		3
Additional Mathematics/Statistics (2000+)		3
Science or Engineering		3-4
University Core and/or General Electives		3
<b>Credits</b>		<b>15-16</b>
<b>Spring</b>		
CSCI 3200	Programming Languages	3
CSCI 3300	Software Engineering	3
Additional Mathematics/Statistics (2000+)		3
University Core and/or General Electives		6
<b>Credits</b>		<b>15</b>
<b>Year Four</b>		
<b>Fall</b>		
CSCI 4961	Capstone Project I	2
CSCI 3000+	Elective	3
University Core and/or General Electives		9
<b>Credits</b>		<b>14</b>
<b>Spring</b>		
CSCI 4962	Capstone Project II	2
CSCI 3000+	Elective	3

University Core and/or General Electives	9
<b>Credits</b>	<b>14</b>
<b>Total Credits</b>	<b>120-121</b>

‡ Must be in same discipline as Science I to form sequence.

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CSCI 1040	Introduction to Computer Science: Mobile Computing	
CSCI 1050	Introduction to Computer Science: Multimedia	
CSCI 1060	Introduction to Computer Science: Scientific Programming	
CSCI 1070	Introduction to Computer Science: Taming Big Data	
CSCI 1080	Introduction to Computer Science: World Wide Web	
CSCI 1090	Introduction to Computer Science: Special Topics	

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Code	Title	Credits
CSCI 4500	Advanced Operating Systems	
CSCI 4530	Computer Security	
CSCI 4550	Computer Networks	
CSCI 4610	Concurrent and Parallel Programming	
CSCI 4620	Distributed Computing	

## Madrid

Students can complete a B.S. in computer science at SLU's campus in Madrid; they may also transfer freely between the Madrid and St. Louis campuses.

Learn More (<http://www.slu.edu/madrid/academics/degrees-and-programs/computer-science.php>)

## 2+SLU

2+SLU programs provide a guided pathway for students transferring from a partner institution.

- Computer Science, B.S. (STLCC 2+SLU) (<https://catalog.slu.edu/academic-policies/office-admission/undergraduate/2plusslu/stlcc/computer-science-bs/>)