

COMPUTER SCIENCE, B.S.

Computer science is an exciting, rapidly developing field that has vast influence on modern society. Computer science encompasses a broad range of theory 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.

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, and it can be paired with other science, mathematics and engineering programs.

The accelerated program allows SLU 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 bioinformatics and computational biology.

Highlights include:

- A choice of engaging introductory courses, allowing students to better connect the application of computer science to their own interests.
- Courses that are taught in computer labs to allow for hands-on learning and with small class sizes that allow for rich student-faculty interactions.
- A position within the College of Arts and Sciences 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

With our location in the midtown area of St. Louis, our students have access to a strong technology community, with operations for many Fortune 500 companies and a vibrant start-up community. This provides outstanding opportunities for summer internships, for part-time work during the academic year, and for future jobs after graduation.

Our campus is within walking distance of the Cortex Innovation Community (<https://cortexstl.com>), a vibrant 200-acre (and growing) innovation hub and technology district. Cortex is home to 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 (<https://vencafstl.org>) (every Thursday from 3-8pm), 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 (<http://www.downtowntrex.org>), a co-working space and technology incubator.

Our faculty have integrated students into their research programs in a variety of ways. Some of undergraduate students have participated in REUs (research experience for undergraduates), capstone projects and independent research that has resulted in scholarly publications with

their faculty mentors. Graduate students have been hired as research assistants to work with faculty on research grants and have collaborated with faculty mentors as part of research courses. Many students have had opportunities to travel to conference and present their work.

Careers

In recent years, SLU computer science students have accepted paid internships and full-time jobs with the following organizations:

- Amazon
- Anheuser-Busch/InBev
- Apple
- Asynchrony
- Boeing
- Booz Allen Hamilton
- Bullhorn
- Centene
- CenturyLink
- Citi
- Clearent Software
- Cofactor Genomics
- Control Microsystems
- Digital Concepts
- Distribution Management Inc.
- Dotomi
- Equifax Workforce Solutions
- Express Scripts
- FactSet Research Systems
- Garmin
- Groupon
- Hyland Software
- Lickenborck Technologies
- Mastercard
- Monsanto
- National Information Services Corp
- National Security Agency
- Nylas
- Pinterest
- SLU's Center for Digital Humanities
- SLU's Information Technology Services
- Scott Air Force Base
- Scottrade
- Sosh
- Sterneck Capital Management
- Ungerboeck Software

Admission Requirements

Freshman

Begin your application for this program at www.slu.edu/apply. Saint Louis University also accepts the Common App.

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 course work is a primary concern in reviewing a freshman applicant's file. College

admission test scores (ACT or SAT) are used as an additional indicator of the student's ability to meet the academic rigors of Saint Louis University and are used as qualifiers for certain University scholarship programs. To be considered for admission to any Saint Louis University undergraduate program, the applicant must be graduating from an accredited high school or have an acceptable score on the General Education Development (GED) test.

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

Transfer

Begin your application for this program at www.slu.edu/apply.

Applicants must be a graduate of an accredited high school or have an acceptable score on the GED. An official high school transcript and official test scores are required only of those students who have attempted fewer than 24 transferable semester credits (or 30 quarter credits) of college credit. Those having completed 24 or more of college credit need only submit a transcript from 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.

International Applicants

Begin your application for this program at www.slu.edu/apply.

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

- Demonstrate English Language Proficiency (<http://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.

Scholarships and Financial Aid

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

- Scholarships: awarded based on academic achievement, service, leadership and financial need.
- Financial Aid: provided in the form of grants and loans, some of which require repayment.

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

For information on other scholarships and financial aid, visit the student financial services office online at <https://finaid.slu.edu>.

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 a member of a team in developing computing technology and solving technical problems.

Requirements

Computer Science students must complete a minimum total of **77 credit hours** for the major.

Code	Title	Credits
Core Requirement		
College core requirements (p. 3)		54-63
For additional information about core courses (http://catalog.slu.edu/colleges-schools/arts-sciences/#coretext)		
Required Computer Science Courses		
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 2400	Computer Architecture	3
CSCI 3100	Algorithms	3
CSCI 3200	Programming Languages	3
CSCI 3300	Software Engineering	3
CSCI 3500	Operating Systems	3
CSCI 4961	Capstone Project I	2
CSCI 4962	Capstone Project II	2
Select an Applied Systems course (p. 3)		3
Two additional CSCI courses at 3000-level or higher		6
Required Mathematics Courses		
MATH 1510	Calculus I [†]	4
MATH 1520	Calculus II	4
MATH 1660	Discrete Mathematics	3
Three additional MATH/STAT courses at the 2000-level or higher		9
Required Computer Ethics		
PHIL 3410	Computer Ethics [†]	3
Required Science/Engineering Courses		
Select 8 credit sequence in a single lab science. [†]		8
An additional 3 credits of any science/engineering course		3
Total Credits		124

[†] In addition to the major this course fulfills the A&S college core requirements

Introduction to Computer Science

Code	Title	Credits
CSCI 1010	Introduction to Computer Science: Principles	
CSCI 1020	Introduction to Computer Science: Bioinformatics	
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	BME Computing
CVNG 1500	Civil Engineering Computing
STAT 3850	Foundation of Statistics

Applied Systems

Code	Title	Credits
CSCI 3650	Computer Networks	
CSCI 3710	Databases	
CSCI 4650	Computer Security	
CSCI 4850	High-Performance Computing	

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).

Bachelor of Science Core Curriculum Requirements

Code	Title	Credits
Core Components and Credits		
	Foundations of Discourse (http://catalog.slu.edu/colleges-schools/arts-sciences/bs-core/foundations-discourse)	3
	Diversity in the U.S. (http://catalog.slu.edu/colleges-schools/arts-sciences/bs-core/cultural-diversity)	3
	Global Citizenship (http://catalog.slu.edu/colleges-schools/arts-sciences/bs-core/global-citizenship)	3
	Foreign Language (http://catalog.slu.edu/colleges-schools/arts-sciences/bs-core/foreign-language)	0-9
	Fine Arts (http://catalog.slu.edu/colleges-schools/arts-sciences/bs-core/fine-arts)	3

Literature (http://catalog.slu.edu/colleges-schools/arts-sciences/bs-core/literature)	6
Mathematics (http://catalog.slu.edu/colleges-schools/arts-sciences/bs-core/mathematics)	4
Science (http://catalog.slu.edu/colleges-schools/arts-sciences/bs-core/sciences)	8
Philosophy (http://catalog.slu.edu/colleges-schools/arts-sciences/bs-core/philosophy)	6
Social Science (http://catalog.slu.edu/colleges-schools/arts-sciences/bs-core/social-science)	6
Theology (http://catalog.slu.edu/colleges-schools/arts-sciences/bs-core/theology)	6
World History (http://catalog.slu.edu/colleges-schools/arts-sciences/bs-core/world-history)	6
Total Credits	54-63

Graduation Requirements

- Complete a minimum of 120 credits (excluding pre-college level courses [numbered below 1000]).
- Complete either the College of Arts and Sciences Bachelor of Arts or Bachelor of Science Core Curriculum Requirements
- Complete Major Requirements: minimum 30 credits required.
- Complete remaining credits with a second major, minor, certificate, and/or elective credits to reach the minimum of 120 credits required for graduation.
- Achieve at least a 2.00 cumulative grade point average, a 2.00 grade point average in the major(s) and a 2.00 grade point average in the minor/certificate, or related elective credits.
- Complete Dept/Program specific academic and performance requirements.
- Complete at least 50% of the coursework for the major and 75% for the minor/certificate through Saint Louis University or an approved study abroad program.
- Complete 30 of the final 36 credits through Saint Louis University or an approved study abroad program.
- Complete an online degree application by the required University deadline.

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
Year One		
Fall		
CSCI 10xx	Introduction to Computer Science (p. 4)	3
MATH 1510	Calculus I	4
MATH 1660	Discrete Mathematics	3

Core	Foreign Language 1010	3
ENGL 1900 or ENGL 1940	Advanced Strategies Of Rhetoric and Research or Advanced Writing	3
Credits		16
Spring		
CSCI 1300	Introduction to Object-Oriented Programming	4
MATH 1520	Calculus II	4
THEO 1000	Theological Foundations	3
Core	Foreign Language 1020	3
Credits		14
Year Two		
Fall		
CSCI 2100	Data Structures	4
Additional Mathematics (2000+)		3
Science I with lab		4
PHIL 2050	Ethics	3
Credits		14
Spring		
CSCI 2300	Object-Oriented Software Design	3
CSCI 2400	Computer Architecture	3
Science II with lab ‡		4
PHIL 3410	Computer Ethics	3
Core	Fine and Performing Arts	3
Credits		16
Year Three		
Fall		
CSCI 3100	Algorithms	3
CSCI 3500	Operating Systems	3
Additional Mathematics (2000+)		3
HIST 1110	Origins of the Modern World to 1500	3
Core	Social Science	3
Credits		15
Spring		
CSCI 3200	Programming Languages	3
CSCI 3300	Software Engineering	3
Additional mathematics (2000+)		3
HIST 1120	Origins of the Modern World, 1500 to Present	3
Core	Social Science	3
Credits		15
Year Four		
Fall		
CSCI 4961	Capstone Project I	2
CSCI 3000+	Elective	3
CSCI Applied Systems Course (p. 4)		3
Additional Science or Engineering		3
Core	Theology 2xxx	3
Core	Cultural Diversity in the U.S.	3
Credits		17

Spring		
CSCI 4962	Capstone Project II	2
CSCI 3000+	Elective	3
Core	Literature	3
Core	Global Citizenship	3
General Elective		3
Credits		14
Total Credits		121

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

Program Notes

Introduction to Computer Science

Code	Title	Credits
CSCI 1010	Introduction to Computer Science: Principles	
CSCI 1020	Introduction to Computer Science: Bioinformatics	
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	BME Computing	
CVNG 1500	Civil Engineering Computing	
STAT 3850	Foundation of Statistics	

Applied Systems

Code	Title	Credits
CSCI 3650	Computer Networks	
CSCI 3710	Databases	
CSCI 4650	Computer Security	
CSCI 4850	High-Performance Computing	