

COMPUTER SCIENCE, B.A.

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.A. curriculum includes a broad liberal arts study and can be combined with a second major or minor in fields such as art, criminal science or psychology.

SLU's accelerated master's 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 computer science, software engineering, artificial intelligence, or bioinformatics and computational biology.

Program Highlights

- 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 Arts curriculum in computer science obtain a rigorous, comprehensive background in the discipline. With this curriculum, they are afforded time to delve into other academic interests, including pre-professional studies or a minor or major in another discipline. Students should consult with their advisor to tailor their computer science electives to their individual goals.

Fieldwork and Research Opportunities

Because of 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 startup community. This provides outstanding opportunities for summer internships, part-time work during the academic year, and 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://venturecafestl.org>) (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 (<http://www.downtownrex.org/>), a coworking space and technology incubator.

Our faculty have integrated students into their research programs in a variety of ways. Some of our 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. 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 wonderful combination of excellent pay, satisfying work-life balance, and personal reward in seeing the great impact that computing can have throughout society. As a sample of such listings:

- U.S. News 100 Best Jobs list for 2021 (<https://money.usnews.com/careers/best-jobs/rankings/the-100-best-jobs/>) named software developer as #2. The top 100 also included data scientist (#8), IT manager (#12), information security analyst (#15), computer systems analyst (#47), computer network architect (#51), database administrator (#55), web developer (#59), computer systems administrator (#86).
- Glassdoor's 50 Best Jobs in America list for 2021 (https://www.glassdoor.com/List/Best-Jobs-in-America-LST_KQ0,20.htm) named java developer as #1 and data scientist as #2, and many other technology positions appear within the top 25: enterprise architect (#4), devops engineer (#5), information security engineer (#6), mobile engineer (#8), software engineer (#9), front end engineer (#11), back end engineer (#16), machine learning engineer (#17), cloud engineer (#23), UX designer (#24).
- Indeed.com's Best Jobs of 2020 (<https://www.indeed.com/lead/best-jobs-2020/>) named software architect as #1 and full stack developer as #2. Also included in the top 25 were java developer (#7), data scientist (#8), IT security specialist (#9), data engineer (#12) and cloud engineer (#20).

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

For priority consideration for merit-based scholarships, 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://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 a member of a team in developing computing technology and solving technical problems.

Requirements

Computer science students must complete a minimum total of **53 credits** for the major.

Code	Title	Credits
Core Requirement		
College core requirements (p. 3)		57-66
For additional information about core courses		
Required Computer Science Courses		
Select a CSCI 10xx: Introduction to Computer Science (p. 2)		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 4961	Capstone Project I	2
CSCI 4962	Capstone Project II	2
Select one Systems Elective course (p. 2)		3
Select one Theory course (p. 3)		3
Two additional 3000 or 4000 level CSCI elective courses		6
Required Mathematics Courses		
MATH 1510	Calculus I [†]	4
MATH 1520	Calculus II	4
MATH 1660	Discrete Mathematics	3
One additional MATH/STAT course at the 2000-level or higher		3
Required Computer Ethics		
PHIL 3410	Computer Ethics [†]	3
General Electives		8
Total Credits		120

[†] In addition to the major, this course fulfills the core requirements for the College of Arts and Sciences.

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	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

Theory Courses

Code	Title	Credits
CSCI 3100	Algorithms	
CSCI 3200	Programming Languages	

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.

Bachelor of Arts Core Curriculum Requirements

Code	Title	Credits
Please note: beginning in Fall 2022, all incoming SLU undergraduates—regardless of major, program, college or school—will complete the University Core curriculum. You can find more information about SLU's common Core here: https://www.slu.edu/core/index.php (https://www.slu.edu/core/)		

Core Components and Credits

Foundations of Discourse	3
Diversity in the U.S.	3
Global Citizenship	3
Foreign Language	0-9
Fine Arts	3
Literature	6
Mathematics	3
Natural Science	6
Philosophy	9
Social Science	6
Theology	9
World History	6
Total Credits	57-66

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 electives to reach the minimum of 120 credits required for graduation.
- Courses listed under the intensive English program do not count toward graduation requirements. EAP 1500 College Composition for International Students (3 cr), EAP 1900 Rhetoric & Research Strategies (3 cr) and EAP 2850 Nation, Identity and Literature (3 cr) count toward graduation requirements as equivalents to Department of English courses.

In addition to those courses, six credits from EAP/MLNG courses at the 1000 level or higher may count toward graduation requirements

- 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 department/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 1660	Discrete Mathematics	3
Core	Science	3
ENGL 1900 or ENGL 1940	Advanced Strategies of Rhetoric and Research or Advanced Writing	3
THEO 1000	Theological Foundations	3
Credits		15
Spring		
CSCI 1300	Introduction to Object-Oriented Programming	4
MATH 1510	Calculus I	4
Core	Foreign Language 1020	3
PHIL 1050	Introduction to Philosophy: Self and Reality	3
Credits		14

Year Two**Fall**

CSCI 2100	Data Structures	4
CSCI 2500	Computer Organization and Systems	3
MATH 1520	Calculus II	4
Core	Foreign Language 2010	3
Core	Science	3-4

Credits **17-18**

Spring

CSCI 2300	Object-Oriented Software Design	3
CSCI 2510	Principles of Computing Systems	3
Additional Mathematics/Statistics (2000+)		3
Core	Science	3-4
Core	Literature	3

Credits **15-16**

Year Three**Fall**

Systems Elective Course (p. 4)		3
CSCI 3000+	Elective	3
PHIL 2050	Ethics	3
HIST 1110	Origins of the Modern World to 1500	3
Core	Social Science	3

Credits **15**

Spring

CSCI 3000+	Elective	3
Core	Theology Elective 2xxx	3
PHIL 3410	Computer Ethics	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 Theory Course (p. 4)		3
Core	Theology 3xxx	3
Core	Cultural Diversity in the U.S.	3
General Elective		3

Credits **14**

Spring

CSCI 4962	Capstone Project II	2
Core	Literature	3
Core	Fine and Performing Arts	3
Core	Global Citizenship	3
General Elective		4

Credits **15**

Total Credits **120-122**

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

Systems Elective 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	

Theory Courses

Code	Title	Credits
CSCI 3100	Algorithms	
CSCI 3200	Programming Languages	

Madrid

Students can complete a B.A. 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>)