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.

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.

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.

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.

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://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.downtowntrex.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.

**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 76 credits for the major.

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<tr>
<td>CSCI 1050</td>
<td>Introduction to Computer Science: Multimedia</td>
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<tr>
<td>CSCI 1060</td>
<td>Introduction to Computer Science: Scientific Programming</td>
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<tr>
<td>CSCI 1070</td>
<td>Introduction to Computer Science: Taming Big Data</td>
<td></td>
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<tr>
<td>CSCI 1080</td>
<td>Introduction to Computer Science: World Wide Web</td>
<td></td>
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<tr>
<td>CSCI 1090</td>
<td>Introduction to Computer Science: Special Topics</td>
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With permission, a computing-intensive course from another discipline may be substituted. Examples of such courses include:

- BME 2000  Biomedical Engineering Computing
 Systems Electives Courses

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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 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 Science Core Curriculum Requirements

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<td>CSCI 10xx</td>
<td>Introduction to Computer Science</td>
<td>3</td>
</tr>
<tr>
<td>MATH 1510</td>
<td>Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>ENGL 1900</td>
<td>Advanced Strategies of Rhetoric and Research or Advanced Writing</td>
<td>3</td>
</tr>
<tr>
<td>Core</td>
<td>Foreign Language 1010</td>
<td>3</td>
</tr>
<tr>
<td>THEO 1000</td>
<td>Theological Foundations</td>
<td>3</td>
</tr>
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</table>

Core Components and Credits

- Foundations of Discourse: 3 credits
- Diversity in the U.S.: 3 credits
- Global Citizenship: 3 credits
- Foreign Language: 0-6 credits
- Fine Arts: 3 credits
- Literature: 6 credits
- Mathematics: 4 credits
- Science: 8 credits
- Philosophy: 6 credits
- Social Science: 6 credits
- Theology: 6 credits
- World History: 6 credits

Total Credits: 54-60

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.
- 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.

<table>
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<tr>
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<tr>
<td>CSCI 1300</td>
<td>Introduction to Object-Oriented Programming</td>
<td>4</td>
</tr>
<tr>
<td>MATH 1520</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>Core</td>
<td>Foreign Language 1020</td>
<td>3</td>
</tr>
<tr>
<td>PHIL 2050</td>
<td>Ethics</td>
<td>3</td>
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Credits: 14

Year Two

Fall

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<tr>
<td>CSCI 2100</td>
<td>Data Structures</td>
<td>4</td>
</tr>
<tr>
<td>CSCI 2500</td>
<td>Computer Organization and Systems</td>
<td>3</td>
</tr>
<tr>
<td>MATH 1660</td>
<td>Discrete Mathematics</td>
<td>3</td>
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<tr>
<td>Science I with lab</td>
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PHIL 3410  Computer Ethics  3  

**Spring**

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  
Core  Theology 2xxx  3  

**Credits**  17  

**Year Three**

**Fall**

CSCI 3100  Algorithms  3  
Systems Elective Course (p. 4)  3  
Additional Mathematics/Statistics (2000+)  3  
HIST 1110  Origins of the Modern World to 1500  3  
Science or Engineering  3-4  

**Credits**  16  

**Spring**

CSCI 3200  Programming Languages  3  
CSCI 3300  Software Engineering  3  
Additional Mathematics/Statistics (2000+)  3  
HIST 1120  Origins of the Modern World (1500 to Present)  3  
Core  Literature  3  

**Credits**  15-16  

**Year Four**

**Fall**

CSCI 4961  Capstone Project I  2  
CSCI 3000+  Elective  3  
Core  Fine and Performing Arts  3  
Core  Theology 2xxx  3  
Core  Global Citizenship  3  

**Credits**  14  

**Spring**

CSCI 4962  Capstone Project II  2  
CSCI 3000+  Elective  3  
Core  Social Science  3  
Core  Diversity in the U.S.  3  
General Elective  3  

**Credits**  14  

**Total Credits**  121-122  

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

**Program Notes**

**Introduction to Computer Science**

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**Systems Elective Courses**

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**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)