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.

Computer science courses are taught in small sections to allow for the best dialogue between the instructor and the students. Courses are taught in computer classrooms, emphasize practice as well as theory and often involve substantial group work.

Additional highlights include:

• A choice of engaging introductory courses, allowing them to better connect the application of computer science to 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

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.

**Transfer**

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**

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 http://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**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Core Requirement</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>College core requirements (p. 3)</td>
<td>54-63</td>
</tr>
<tr>
<td></td>
<td>For additional information about core courses (<a href="http://catalog.slu.edu/colleges-schools/arts-sciences/#coretext">http://catalog.slu.edu/colleges-schools/arts-sciences/#coretext</a>)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Required Computer Science Courses</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Select a CSCI 10xx: Introduction to Computer Science (p. 3)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CSCI 1300 Introduction to Object-Oriented Programming</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>CSCI 2100 Data Structures</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>CSCI 2300 Object-Oriented Software Design</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CSCI 2400 Computer Architecture</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CSCI 3100 Algorithms</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CSCI 3200 Programming Languages</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CSCI 3300 Software Engineering</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CSCI 3500 Operating Systems</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>CSCI 4961 Capstone Project I</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>CSCI 4962 Capstone Project II</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Select an Applied Systems course (p. 3)</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Two additional CSCI courses at 3000-level or higher</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td><strong>Required Mathematics Courses</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MATH 1510 Calculus I †</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>MATH 1520 Calculus II</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>MATH 1660 Discrete Mathematics</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Three additional MATH/STAT courses at the 2000-level or higher</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td><strong>Required Computer Ethics</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PHIL 3410 Computer Ethics †</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>Required Science/Engineering Courses</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Select 8 credit sequence in a single lab science. †</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>An additional 3 credits of any science/engineering course</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Total Credits</td>
<td>124</td>
</tr>
</tbody>
</table>

† In addition to the major this course fulfills the A&S college core requirements
## Introduction to Computer Science

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSCI 1010</td>
<td>Introduction to Computer Science: Principles</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 1020</td>
<td>Introduction to Computer Science: Bioinformatics</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 1030</td>
<td>Introduction to Computer Science: Game Design</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 1040</td>
<td>Introduction to Computer Science: Mobile Computing</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 1050</td>
<td>Introduction to Computer Science: Multimedia</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 1060</td>
<td>Introduction to Computer Science: Scientific Programming</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 1070</td>
<td>Introduction to Computer Science: Taming Big Data</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 1080</td>
<td>Introduction to Computer Science: Web Development</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 1090</td>
<td>Introduction to Computer Science: Special Topics</td>
<td>1-4</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSCI 3650</td>
<td>Network Programming I</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 3710</td>
<td>Databases</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 4650</td>
<td>Computer Security</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 4850</td>
<td>High-Performance Computing</td>
<td>3</td>
</tr>
</tbody>
</table>

### 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

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

Literature ([http://catalog.slu.edu/colleges-schools/arts-sciences/bs-core/literature](http://catalog.slu.edu/colleges-schools/arts-sciences/bs-core/literature))

Mathematics ([http://catalog.slu.edu/colleges-schools/arts-sciences/bs-core/mathematics](http://catalog.slu.edu/colleges-schools/arts-sciences/bs-core/mathematics))

Science ([http://catalog.slu.edu/colleges-schools/arts-sciences/bs-core/sciences](http://catalog.slu.edu/colleges-schools/arts-sciences/bs-core/sciences))

Philosophy ([http://catalog.slu.edu/colleges-schools/arts-sciences/bs-core/philosophy](http://catalog.slu.edu/colleges-schools/arts-sciences/bs-core/philosophy))

Social Science ([http://catalog.slu.edu/colleges-schools/arts-sciences/bs-core/social-science](http://catalog.slu.edu/colleges-schools/arts-sciences/bs-core/social-science))

Theology ([http://catalog.slu.edu/colleges-schools/arts-sciences/bs-core/theology](http://catalog.slu.edu/colleges-schools/arts-sciences/bs-core/theology))

World History ([http://catalog.slu.edu/colleges-schools/arts-sciences/bs-core/world-history](http://catalog.slu.edu/colleges-schools/arts-sciences/bs-core/world-history))

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.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year One</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fall</td>
<td></td>
<td></td>
</tr>
<tr>
<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>MATH 1660</td>
<td>Discrete Mathematics</td>
<td>3</td>
</tr>
</tbody>
</table>
### Year Two

#### Fall
- CSCI 2100  Data Structures  4
- Additional Mathematics (2000+)  3
- Science I with lab  4
- PHIL 2050  Ethics  3

#### 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  14

### 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

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### Program Notes

**Introduction to Computer Science**

- CSCI 1010  Introduction to Computer Science: Principles  3
- CSCI 1020  Introduction to Computer Science: Bioinformatics  3
- CSCI 1030  Introduction to Computer Science: Game Design  3
- CSCI 1040  Introduction to Computer Science: Mobile Computing  3
- CSCI 1050  Introduction to Computer Science: Multimedia  3
- CSCI 1060  Introduction to Computer Science: Scientific Programming  3
- CSCI 1070  Introduction to Computer Science: Taming Big Data  3
- CSCI 1080  Introduction to Computer Science: Web Development  3
- CSCI 1090  Introduction to Computer Science: Special Topics  1-4

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- BME 2000  BME Computing  3
- CVNG 1500  Civil Engineering Computing  3
- STAT 3850  Foundation of Statistics  3

**Applied Systems**

- CSCI 3650  Network Programming I  3
- CSCI 3710  Databases  3
- CSCI 4650  Computer Security  3
- CSCI 4850  High-Performance Computing  3

**Theory**

- CSCI 3100  Algorithms  3
- CSCI 3200  Programming Languages  3
- CSCI 3250  Compilers  3
- CSCI 4130  Automata  3