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.

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 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://vencafstl.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. 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 conferences 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 (http://www.slu.edu/apply.php). 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.

To be considered for admission to any Saint Louis University undergraduate program, the applicant must be graduating from an accredited high school, have an acceptable HiSET exam score or take the General Education Development (GED) test. Beginning with the 2021-22 academic year, undergraduate applicants will not be required to submit standardized test scores (ACT or SAT) in order to be considered for admission. Applicants will be evaluated equally, with or without submitted test scores.

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

**Transfer**

Begin your application for this program at www.slu.edu/apply (http://www.slu.edu/apply.php).

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 (http://www.slu.edu/apply.php).

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, 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.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHIL 3410</td>
<td>Computer Ethics †</td>
<td>3</td>
</tr>
<tr>
<td>MATH 1510</td>
<td>Calculus I †</td>
<td>4</td>
</tr>
<tr>
<td>MATH 1520</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 1660</td>
<td>Discrete Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>One additional MATH/STAT course at the 2000-level or higher</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td><strong>Required Computer Ethics</strong></td>
<td></td>
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</tbody>
</table>

Required Mathematics Courses

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<th>Credits</th>
</tr>
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<td>MATH 1510</td>
<td>Calculus I †</td>
<td>4</td>
</tr>
<tr>
<td>MATH 1520</td>
<td>Calculus II</td>
<td>4</td>
</tr>
<tr>
<td>MATH 1660</td>
<td>Discrete Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>One additional MATH/STAT course at the 2000-level or higher</td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

Required Computer Science Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSCI 10xx</td>
<td>Introduction to Computer Science</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 1300</td>
<td>Introduction to Object-Oriented Programming</td>
<td>4</td>
</tr>
<tr>
<td>CSCI 2100</td>
<td>Data Structures</td>
<td>4</td>
</tr>
<tr>
<td>CSCI 2300</td>
<td>Object-Oriented Software Design</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 2400</td>
<td>Computer Architecture</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 3500</td>
<td>Operating Systems</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 4961</td>
<td>Capstone Project I</td>
<td>2</td>
</tr>
<tr>
<td>CSCI 4962</td>
<td>Capstone Project II</td>
<td>2</td>
</tr>
<tr>
<td>Select one Applied Systems course (p. 3)</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Select one Theory course (p. 3)</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Two additional CSCI courses at 3000-level or higher</td>
<td></td>
<td>6</td>
</tr>
</tbody>
</table>

For additional information about core courses (http://catalog.slu.edu/colleges-schools/arts-sciences/#coretext)

College core requirements (p. 3) 57-66

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/).
In addition to the major this course fulfills the A&S college core requirements.

### Introduction to Computer Science

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>CSCI 1010</td>
<td>Introduction to Computer Science: Principles</td>
<td></td>
</tr>
<tr>
<td>CSCI 1020</td>
<td>Introduction to Computer Science: Bioinformatics</td>
<td></td>
</tr>
<tr>
<td>CSCI 1030</td>
<td>Introduction to Computer Science: Game Design</td>
<td></td>
</tr>
<tr>
<td>CSCI 1040</td>
<td>Introduction to Computer Science: Mobile Computing</td>
<td></td>
</tr>
<tr>
<td>CSCI 1050</td>
<td>Introduction to Computer Science: Multimedia</td>
<td></td>
</tr>
<tr>
<td>CSCI 1060</td>
<td>Introduction to Computer Science: Scientific Programming</td>
<td></td>
</tr>
<tr>
<td>CSCI 1070</td>
<td>Introduction to Computer Science: Taming Big Data</td>
<td></td>
</tr>
<tr>
<td>CSCI 1080</td>
<td>Introduction to Computer Science: World Wide Web</td>
<td></td>
</tr>
<tr>
<td>CSCI 1090</td>
<td>Introduction to Computer Science: Special Topics</td>
<td></td>
</tr>
</tbody>
</table>

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

### Applied Systems

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSCI 3550</td>
<td>Computer Networks</td>
<td></td>
</tr>
<tr>
<td>CSCI 3710</td>
<td>Databases</td>
<td></td>
</tr>
<tr>
<td>CSCI 4650</td>
<td>Computer Security</td>
<td></td>
</tr>
<tr>
<td>CSCI 4850</td>
<td>High-Performance Computing</td>
<td></td>
</tr>
</tbody>
</table>

### Theory Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSCI 3100</td>
<td>Algorithms</td>
<td></td>
</tr>
<tr>
<td>CSCI 3200</td>
<td>Programming Languages</td>
<td></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 Arts Core Curriculum Requirements

#### Core Components and Credits

- Foundations of Discourse
  - [http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/foundations-discourse/](http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/foundations-discourse/) — 3 credits
- Diversity in the U.S. ([http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/cultural-diversity/](http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/cultural-diversity/)) — 3 credits
- Foreign Language ([http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/foreign-language/](http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/foreign-language/)) — 0-9 credits
- Fine Arts ([http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/fine-arts/](http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/fine-arts/)) — 3 credits
- Literature ([http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/literature/](http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/literature/)) — 6 credits
- Natural Science ([http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/natural-science/](http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/natural-science/)) — 6 credits
- Philosophy ([http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/philosophy/](http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/philosophy/)) — 9 credits
- Social Science ([http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/social-science/](http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/social-science/)) — 6 credits
- Theology ([http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/theology/](http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/theology/)) — 9 credits
- World History ([http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/world-history/](http://catalog.slu.edu/colleges-schools/arts-sciences/ba-core/world-history/)) — 6 credits

**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 elective credits 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 3-4
ENGL 1900 or ENGL 1940  Advanced Strategies of Rhetoric and Research or Advanced Writing 3
THEO 1000  Theological Foundations 3
Credits 15-16

Spring
CSCI 1300  Introduction to Object-Oriented Programming 4
MATH 1510  Calculus I 4
Core  Science 3-4
Core  Foreign Language 1010 3
Credits 14-15

Year Two
Fall
CSCI 2100  Data Structures 4
MATH 1520  Calculus II 4
Core  Foreign Language 1020 3
Core  Fine and Performing Arts 3
HIST 1110  Origins of the Modern World to 1500 3
Credits 17

Spring
CSCI 2300  Object-Oriented Software Design 3
CSCI 2400  Computer Architecture 3
Core  Foreign Language 2010 3
PHIL 1050  Introduction to Philosophy: Self and Reality 3
HIST 1120  Origins of the Modern World (1500 to Present) 3
Credits 15

Year Three
Fall
CSCI 3500  Operating Systems 3
Additional Mathematics/Statistics (2000+) 3
PHIL 2050  Ethics 3
Core  Theology 2xxx 3
Core  Social Science 3
Credits 15

Spring
CSCI Applied Systems Course (p. 4) 3
CSCI 3000+ Elective 3
PHIL 3410  Computer Ethics 3
Core  Literature 3
Core  Social Science 3
Credits 15

Year Four
Fall
CSCI 4961  Capstone Project I 2
CSCI Theory Course (p. 5) 3
Core  Theology 3xxx 3
Core  Cultural Diversity in the U.S. 3
Pure Elective 3
Credits 14

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

Total Credits 119-121

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

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discipline may be substituted. Examples of such courses include:
BME 2000  Biomedical Engineering Computing
CVNG 1500  Civil Engineering Computing
STAT 3850  Foundation of Statistics

Applied Systems
Code  Title  Credits
CSCI 3550  Computer Networks
CSCI 3710  Databases
CSCI 4650  Computer Security
CSCI 4850  High-Performance Computing

### Theory Courses

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</tbody>
</table>

### 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)