SOFTWARE ENGINEERING, M.S.

Saint Louis University’s master’s in software engineering is designed to prepare students interested in developing high-quality, large-scale software systems.

Students enrolled in SLU’s graduate program in software engineering develop and create design strategies using hands-on projects and modern software tools to gain knowledge, skills and experience. Students discover critical design strategies that allow for continual innovation throughout their careers. Guided by outstanding professors, much of the learning is team-based and in small classes.

Curriculum Overview

SLU’s project-based curriculum emphasizes student teamwork and regular student-faculty interactions. Software engineering students gain depth of knowledge in process and techniques for the development of quality software systems and have flexible electives that can explore other areas of computer science such as systems, theory, networking, security and artificial intelligence. A culminating capstone project brings teams together for a full development cycle.

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 startup community. This provides outstanding opportunities for summer internships, for part-time work during the academic year, and for future jobs after graduation.

Employers in St. Louis who show great interest in computer science students include Boeing, Centene, Citi, Deloitte, Enterprise, Express Scripts, KPMG, Maritz, MasterCard, Microsoft, Bayer, and World Wide Technologies. Other students have worked for smaller companies or even started their own companies.

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/), 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.

Careers

Careers related to software engineering and 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 (https://money.usnews.com/careers/best-jobs/rankings/the-100-best-jobs/) list for 2019 named software developer as No. 1, as well as IT manager (No. 12), web developer (No. 23), database administrator (No. 30), information security analyst (No. 38), computer systems analyst (No. 53), computer network architect (No. 60), computer systems administrator (No. 63).
• Glassdoor’s 50 Best Jobs in America (https://www.glassdoor.com/List/Best-Jobs-in-America-LST_KQ020.htm) list for 2020 named front-end engineer as No. 1, Java developer (No. 2), data scientist (No. 3), DevOps engineer (No. 5), data engineer (No. 6), and software engineer (No. 7). Also listed were mobile developer (No. 8), applications engineer (No. 18), systems engineer (No. 27), scrum master (No. 29), software developer (No. 32), cloud engineer (No. 33), UX designer (No. 38), QA engineer (No. 39) and network engineer (No. 49).
• Indeed.com’s Best Jobs of 2019 (http://blog.indeed.com/2019/03/14/best-jobs-2019/) named machine learning engineer as No. 1. Also included were full-stack developer (No. 3), computer vision engineer (No. 13), and data scientist (No. 22).

Admission Requirements

A bachelor’s degree in a science, technology, engineering or math major (STEM) is typical. Most successful applicants have an undergraduate grade point average of 3.00 or better on a 4.00 scale. Applicants should have evidence of strong computational skills (generally through prior coursework in programming and data structures) as well as evidence of strong mathematical skills (generally through prior coursework in calculus and statistics).

Application Requirements

• Application completion and fee
• Transcript(s)
• One letter of recommendation is required; two more are optional
• Résumé
• Statement of professional goals
• GRE general scores recommended

Requirements for International Students

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.

Application Deadlines

Applications for January admission must be completed by the preceding Nov. 1, while applications for August admission must be completed by June 1. Applicants seeking scholarships or graduate assistantships are encouraged to apply earlier.
Review Process
Applications will be reviewed as they are completed. A panel of faculty members from the Department of Computer Science will decide on acceptance, and all applicants will be evaluated for potential scholarships or assistantships.

Scholarships, Assistantships and Financial Aid
The computer science department offers several forms of merit-based financial support for graduate students. These include possible tuition scholarships, and graduate assistantships that may include full or partial tuition, health insurance, and a stipend for living expenses in exchange for the assistant’s contributions to the teaching or research mission of the department. Students may also seek their own scholarships from a variety of independent organizations that support graduate education in STEM fields.

For more information, visit the student financial services office online at http://www.slu.edu/financial-aid/.

Learning Outcomes
1. Graduates will be able to design, implement, evaluate and test a complex software system that meets a given set of computing requirements.
2. Graduates will be able to utilize project management processes and tools through the complete software life cycle.
3. Graduates will be able to assess relevant literature and technical documents in the field of computing.
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

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CSCI 5030</td>
<td>Principles of Software Development</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 5050</td>
<td>Computing and Society</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 5300</td>
<td>Software Engineering</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 5960</td>
<td>Software Engineering Capstone Project</td>
<td>3</td>
</tr>
<tr>
<td>CSCI 5301-5399</td>
<td>Software Engineering Electives</td>
<td>9</td>
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</tbody>
</table>

General Electives
Select an additional three courses numbered CSCI 5090-5930. These may include:

- CSCI 5301-5399 Additional courses from the Software Engineering

Internship with Students may apply at most 3 credits of CSCI 5910 Industry

Total Credits 30

Continuation Standards
Students must maintain a cumulative grade point average (GPA) of 3.00 in all graduate/professional courses.

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 Year One</th>
<th>Title</th>
<th>Credits</th>
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<tr>
<td>Fall</td>
<td>CSCI 5030 Principles of Software Development</td>
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<tr>
<td>Spring</td>
<td>CSCI 5300 Software Engineering</td>
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<tr>
<td>Year Two</td>
<td>CSCI 5960 Software Engineering Capstone Project</td>
<td>3</td>
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General Electives
Select an additional three courses numbered CSCI 5090-5930. These may include:

- CSCI 5301-5399 Additional courses from the Software Engineering

Internship with Students may apply at most 3 credits of CSCI 5910 Industry

Total Credits 30

Program Notes

General Electives
The general electives may include additional selections from the software engineering category, courses numbered CSCI 5301-5399.

Internship with Industry
Students may apply at most 3 credits of Internship with Industry (CSCI 5910) toward the degree requirements.