

SLU Computer Science Graduate Student Handbook



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1 General Program Overview

The Department of Computer Science offers the following five graduate degrees:

- Master of Science in Computer Science
- Master of Science in Software Engineering
- Master of Science in Artificial Intelligence
- Master of Science in Bioinformatics and Computational Biology
- Doctor of Philosophy (Ph.D.) in Computer Science

The M.S. in Computer Science provides breadth of knowledge in the field, enabling students to continue to a doctoral program in Computer Science, or to be well-prepared for a variety of research and development positions in industry and government agencies.

The M.S. in Software Engineering curriculum is more tailored and professionally-oriented, enhancing students' skills and experience in developing high-quality, large-scale software systems.

The M.S. in Artificial Intelligence (AI) equips graduates with advanced technical expertise to create innovative AI systems and a deep understanding of the human and ethical considerations crucial to their responsible deployment.

The M.S. in Bioinformatics and Computational Biology (BCB) is an interdisciplinary program that draws on faculty from the Departments of Biology, Computer Science, Mathematics and Statistics, and Chemistry.

Students in our Ph.D. program in Computer Science conduct independent, innovative research under the guidance of a member of our graduate faculty. The program prepares students for careers in industry or academia that leverage the power of computers to positively impact the world.

In addition to the programs above, SLU offers a variety of Accelerated Bachelor's/Master's curricula for existing undergraduate students. These "ABM" combinations typically allow students to graduate with both a Bachelor's degree and a Master's degree with an integrated five-year plan that allows some graduate work to be completed while still an undergraduate student.

We have a strong contingent of international students in all of our programs. Applicants are welcome to apply for direct admission to our graduate programs, or to enroll in various pathway programs that provide additional English language instruction alongside courses toward the academic degree.

2 Contact Information

The Graduate Coordinator (GC)¹ is the key contact for all aspects of the graduate program. The GC oversees all day-to-day aspects of the graduate program and serves as an important focal point of contact for all graduate students. The GC addresses all issues related to program administration, such as admission, advising, and approvals of programs of study. The GC also works closely with the department chair to make decisions pertaining to financial assistance in the form of scholarships, graduate assistantships, and fellowships.

GC for CS/AI	Flavio Esposito	flavio.esposito@slu.edu
GC for BCB	Maureen Donlin	maureen.donlin@health.slu.edu
Department Chair	Min Choi	min.choi@slu.edu
Department Admin	Logan Corry	logan.corry@health.slu.edu
System Administrator	Christopher Jones	chris.jones.1@health.slu.edu
Associate Dean for Grad Affairs	April Trees	april.trees@slu.edu
MS Candidacy Advisor	LaToya Cash	latoya.cash@slu.edu
Ph.D. Candidacy Advisor	Christine Harper	christine.harper@slu.edu
Graduate Admissions	Staff	ssegrad@slu.edu
International Services	Staff	internationalservices@slu.edu

3 Admissions

3.1 Direct Admission

Applicants for any of our graduate programs must submit a formal application through the Graduate Admissions.² The university is on a semester system, with the fall semester running from August through December, and the spring semester running from January through May. We admit students for either semester (though the majority tend to begin in the fall semester). Applications for January admission must be completed by the preceding November 1st, while applications for August admission must be completed by June 1st. Applicants seeking scholarships or graduate assistantships are strongly encouraged to apply by February 1st for August intake.

The Office of Graduate Education will forward the application materials to the department's Graduate Director. The Director will then call a meeting of the Department Admissions Committee to review the application and make a recommendation to the Associate Dean for Graduate Affairs about acceptance and a recommendation to the Director about whether the candidate should be eligible for an assistantship.

¹Sometimes in SLU forms or documents you may find the term Graduate Director (GD), or Director of Graduate Studies (DGS)

²<https://www.slu.edu/admission/graduate/index.php>

Applicants must provide transcripts for all previous education, a résumé, a professional goal statement, and three letters of recommendation. The GRE test is not required for admission to the program, but it is highly recommended. It is particularly important for students who are hoping for an assistantship or larger scholarships. These awards are highly competitive, and GRE scores are important indicators for evaluating the strength of an applicant.

International students must also provide a declaration of financial support and must demonstrate English language proficiency, either by submitting their TOEFL or IELTS results or by completion of English Level 6 with no grades below a “B”. Minimum scores for direct admission are TOEFL IBT 80, or IELTS 6.5. There are dedicated admission counselors who specialize in working with international students, and who can provide additional information on the English language proficiency requirements for direct admission. For students who fall short of the English proficiency requirement, we offer specialized “graduate pathways” which combine courses in Academic English with coursework in Computer Science. See §3.3 below for more information.

Students with a strong academic background who have most, but not all, of the prerequisite courses (as outlined below) may be admitted to one of our *Gateway Programs*, in which certain specified prerequisite courses may be completed at SLU along with the requirements for the M.S. program of interest. See §3.4 below for more information.

3.1.1 M.S. in Computer Science

For direct entry into the M.S. in Computer Science program, a typical applicant will have a bachelor’s degree with a minimum GPA of 3.0 on a 4.0 scale, a major in Computer Science or a closely related field, and the following prerequisite courses:

- Introduction to Programming
- Data Structures
- Object-Oriented Design
- Computer Architecture
- Algorithms
- Operating Systems
- Calculus I & II
- Discrete Mathematics
- Introduction to Statistics

3.1.2 M.S. in Software Engineering

For direct entry into the M.S. in Software Engineering program ³, a typical applicant will have a bachelor’s degree in a science, technology, engineering or math major (STEM) and a

³The department is in the process of phasing out the MS in Software Engineering program; prospective applicants are encouraged to consider applying to our MS in Artificial Intelligence or MS in Computer Science programs instead.

minimum GPA of 3.0 on a 4.0 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).

3.1.3 M.S. in Artificial Intelligence

For direct entry into the M.S. in Artificial Intelligence, 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 3.0 or better on a 4.0 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). Typical prerequisite coursework would include:

- Introduction to Programming
- Data Structures
- Object-Oriented Design
- Calculus I & II
- Introduction to Statistics

3.1.4 M.S. in Bioinformatics and Computational Biology

For direct entry into the M.S. in Bioinformatics and Computational Biology, a bachelor's degree in biology, biochemistry, computer science, engineering, health science, mathematics, statistics, or a similar scientific field is required. The faculty admissions committee considers the applicant's prior coursework or experience in genetics, biology, and computer programming when determining required coursework.

3.1.5 Ph.D. in Computer Science

A bachelor's or master's degree in computer science or a closely related field is required. Most successful applicants have an undergraduate grade point average of 3.50 or better on a 4.00 scale. Students with only a bachelor's degree are strongly encouraged to apply first to the M.S. program in Computer Science, since the requirements for the first two years of the Ph.D. program were designed to closely match the M.S. requirements. After completion of the M.S. in Computer Science, students may then be admitted directly to the Ph.D. program by means of a petition⁴ submitted to the Graduate Director.

3.2 Accelerated Bachelor's/Master's Admission

Undergraduate students at SLU may apply to join an ABM program in the Spring of their traditional "junior year". Students **should not** go through the typical graduate admissions

⁴https://www.slu.edu/academics/graduate/current-students/forms-petitions/phd_admit_petition_fillable.pdf

process (because we know them so well already), and we do not require GRE scores to apply. Instead, all that is required is short application form⁵ and a 1-2 page statement of purpose.

If accepted to the ABM program, the student's Banner record will be coded to reflect the educational goal of pursuing the ABM program. However, the student will remain classified as an undergraduate for the purposes of financial aid and scholarships until the bachelor's degree is awarded. Students are allowed to take some graduate courses during their traditional "senior year". Furthermore, up to 15 credit hours of those graduate courses can simultaneously be used to satisfy undergraduate degree requirements (presuming the courses are relevant in meeting such requirements). When students complete their undergraduate degree, they are reclassified as graduate students in order to complete their graduate studies. Once reclassified to graduate status, students may be considered for graduate assistantships.

3.3 Graduate Pathways

Students with the appropriate academic background but lacking sufficient English language proficiency might consider one-semester or two-semester graduate pathways administered by a SLU INTO partnership. These pathways provide additional English language instruction alongside courses toward the academic degree. For more information, or to apply for one of the pathway programs, please visit <https://www.intostudy.com/en/universities/saint-louis-university>.

3.4 Gateway Programs

SLU's Gateway programs support students from any undergraduate major who wish to pursue a Master's degree in Computer Science, Artificial Intelligence, or Software Engineering. Students admitted to a Gateway program complete preparatory coursework in computer science and mathematics, and with grades of B or higher in those courses they automatically advance into their chosen MS program.

Students may complete the preparatory coursework either in accelerated fashion as a full-time student, or as a part-time student over a longer period of time. Students may apply for Federal Direct loans for up to 12 months while in this formal graduate preparatory program.

Successful applicants must have a bachelor's degree from an accredited university with a cumulative GPA of 3.3 or higher on a 4.0 scale and evidence of strong analytical and quantitative skills.

⁵https://www.slu.edu/arts-and-sciences/pdfs/2019_abm_application.pdf

4 Information for Admitted Students

4.1 Accepting Admission

First and foremost, it is essential that all new students complete the steps on this page to finalize their enrollment: <https://www.slu.edu/admission/graduate/admitted-students.php>

4.2 For International Students

Additional step-by-step instructions for international students to obtain an I-20 form and begin the visa application process can be found here: <https://www.slu.edu/international-services/study/index.php>.

Upon arrival, all international students who are new to Saint Louis University must check in with Cathy Donahue in International Services upon arrival. International Services is located in Des Peres Hall, Room 102. You must present your passport, I-20, and I-94 record. You should register for classes either before checking in or immediately thereafter; once these steps have been completed, you can then be registered in the government's SEVIS system.

4.3 For Graduate Assistants

A social security number (SSN) is required for employment as a graduate assistant (teaching or research assistant).

You must be in the United States for 10 days before you can apply for a SSN. You will need two letters to take with you when you apply: one is from your academic department (which the Graduate Director can supply), and one is from International Services. International Services has maps for the local Social Security Administration offices. Once you apply, you will be given a letter verifying that you have applied for a SSN.

Go to Human Resources (located in the Wool Building, 3545 Lindell Avenue) to complete tax and I-9 forms. They will need to see the letter given to you by the Social Security Administration when you applied for a SSN. In addition, be sure to bring the required documentation listed on the "Completion of Tax and I-9 Paperwork" sheet included with your assistantship contract. The tax and I-9 paperwork must be completed on or before the start date of your contract. The I-9 cannot be completed prior to your arrival in the US.

Once you receive your social security card, you must return to Human Resources and present the card to them so that your SSN is on file with the University.

Because of the requirement to be in the United States for ten days prior to applying for a SSN, you should plan to arrive at least two weeks prior to the start date of your graduate appointment to complete the above paperwork. Completion of the required paperwork must be done in order for you to receive your monthly stipend (issued on the last working day of the month).

4.4 Housing

There is on-campus housing available for graduate and professional students in Robert May Hall, which offers 12-month leases. For more information, visit SLU's Office of Housing and Residence Life.⁶

The majority of our graduate students live off campus. There are several apartment complexes within walking distance of campus, including the Coronado Towers, the Drake Plaza, PW Shoe Lofts, Spring Street Lofts, The Standard, and The Icon. There is also a MetroLink stop (light rail public transportation) less than 1km from the department on Grand Boulevard, so it is possible to commute to campus as well. All admitted students are welcome to contact the Graduate Director if they have questions about housing or about particular neighborhoods in St. Louis.

4.5 Graduate Student Orientation

Before the start of each semester, the Provost's office organizes an orientation event for all new graduate students. Check your SLU email address for dates and times. This orientation is strongly encouraged for all students, and is **required** for any student supported by an assistantship.

5 Financial Support

5.1 Assistantships and Fellowships

The department offers a variety of opportunities for financial support through a combination of university-funded and research-funded Graduate Assistantships that include both tuition and a stipend, and through some full or partial tuition scholarships. All candidates who apply to the graduate program by the stated deadline will automatically be considered for financial support in addition to admission to the program.

Up to nine hours of tuition can be provided during the fall and spring semesters. Typically, the award begins on August 15th and ends on May 15th. In some cases, partial assistantships or assistantships limited to a single semester are awarded.

Students may hold a Graduate Research Assistantship for a maximum of two years while pursuing a master's degree.

Graduate Research Assistantships (GRAs) funded by the University are 9-month awards that include a stipend, health insurance, and tuition scholarship. There are no instructional duties associated with appointment to a GRA. Instead, the GRA's faculty sponsor is responsible for directing the research duties of the student. In addition to working on original research, some of the student's time may be spent performing some routine computational tasks or helping oversee undergraduate research. Because the Department has access to a

⁶See <https://www.slu.edu/housing/halls/may-hall.php>.

limited number of GRA positions, students must complete their application by February 1st to be considered.

All students who complete the application process by February 1st will be considered, but priority is generally given to students who have significant undergraduate research experience and already possess some of the computational skills needed to successfully carry out their assigned duties and be capable of working independently.

GRA applications will be reviewed by the Graduate Affairs Committee as part of the overall review of all applications to the program. Some students may be awarded a full or partial assistantship in their second year of the program depending on availability and demonstrated abilities in the course work completed during their first year.

5.2 Internships

Several of our graduate students have been able to secure internship offers while enrolled in the program in order to earn gain experience in the industry, earn some extra money, and still make progress toward their degree. Students can apply up to 3 credit hours of Internship with Industry (CSCI 5910) toward the degree requirements. See §8.6 below for policies and procedures.

5.3 Other Funding Opportunities

- The Graduate Student Foreign Travel Fund provides awards of up to \$1000 to support travel that would enhance the student's graduate training. The proposal format and submission instructions are available here: <https://www.slu.edu/arts-and-sciences/pdfs/graduateforeigntravelsept17.pdf>
- The Graduate/Undergraduate Research Collaboration Fund provides grants of up to \$1000 to support research collaborations between a graduate student and one or two undergraduates, under the supervision of a faculty member. The proposal format and submission instructions are available here: https://www.slu.edu/arts-and-sciences/pdfs/grad_ug_research_fund.pdf
- The Donald G. Brennan Scholarship is a \$2000 award for graduate students who are first generation college students and who have a demonstrated commitment to diversity and social justice. Additional information: <https://www.slu.edu/academics/graduate/graduate-scholarships-fellowships-assistantships.php>

6 Registration

6.1 Academic Advising

The Graduate Director will serve as the academic advisor for all incoming graduate students. For continuing students working on research projects or supported by an assistantship, the

faculty member supervising the research will be assigned as the academic advisor. In either case, the role of the academic advisor is to provide advice on course selection and professional development. The advisor is also the first point of contact for any registration issues.

6.2 Registering for Courses

A typical course load for a graduate student is three courses per semester (9 credit hours), or sometimes three courses plus the one hour Colloquium course for 10 credit hours. Students must take at least 6 credit hours to maintain full-time status.

After meeting with your academic advisor, you may register yourself for courses through MySLU (<https://myslu.slu.edu/>). First click on “Student,” then on “Add or Drop Classes.” Select the appropriate term from the drop-down menu, enter your alternate PIN/registration PIN, if appropriate, and click “Submit.” Each course at SLU is specified by a unique identifier known as a *CRN*. These can be found by searching the university’s course schedule here: <https://catalog.slu.edu/course-search/>. Enter the CRNs of the courses you want to register for.

6.3 ABM Students

There is a special registration process in place for students in the ABM program who have not yet earned their bachelor’s degree and who wish to register for graduate-level courses. Students in this category are **not** required to complete the “Petition by an Undergraduate to Enroll in Graduate Coursework”. Instead, they should send an email to the Associate Dean for Graduate Affairs in the College of Arts and Sciences (contact info in §2 above) with the following information:

- their Banner ID;
- the semester of requested enrollment;
- CRN;
- course number of the course(s) they wish to enroll in.

The request will not be processed if any information is missing. This email must be copied to the Graduate Director as well. The Associate Dean will enter a registration override code and will notify the student by return email that they may register for the desired graduate course(s).

7 Academic Programs

7.1 M.S. in Computer Science

Saint Louis University’s Master’s program in computer science is designed to prepare students for rewarding and in-demand careers that leverage the power of computers, algorithms, and data analyses to impact the world in a positive manner.

Graduates of this program will be able to:

1. Design, implement, evaluate and test a software system that meets a given set of computing requirements,
2. Apply computer science theory, knowledge of computer systems and software development fundamentals to produce computing-based solutions,
3. Assess relevant literature and technical documents in the field of computing,
4. Communicate effectively to both professional and general audiences in both oral and written forms,
5. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles,
6. Function effectively as a member of a team in developing computing technology and solving technical problems.

The Master of Science degree in Computer Science requires a minimum of 33 credit hours beyond a Bachelor's degree, broken down as follows:

Required by MS-CS	
CSCI 5030: Principles of Software Development	3
CSCI 5050: Computing and Society	3
CSCI 5090: Computer Science Colloquium	1
At least one Software Engineering course	3
At least one Systems course	3
At least one Theory course	3
Breadth requirement: Select two courses from two distinct groups	3
CSCI 5200-5299 (Language/Compilers)	
CSCI 5600-5699 (Large Scale Systems)	
CSCI 5700-5799 (Knowledge Systems)	
CSCI 5800-5899 or BCB 5200/5250	
Additional electives	11

- While only 1 credit hour of Colloquium (CSCI 5090) is required, students may repeat that course for credit, applying up to 2 additional credit hours within the elective hours (thereby getting back to a multiple of 3 credit hours on the way to 33 hours).
- A master's thesis is optional. Students completing a thesis should take 6 credit hours of Thesis Research (CSCI 5990) as part of the elective requirements. See §8.9 below for policies and procedures related to the thesis.
- Students may apply at most 3 credit hours of Internship with Industry (CSCI 5910) or a maximum of 3 credit hours of Research Topics (CSCI 5970) toward the degree requirements. See §8.6 below for policies and procedures related to internships.

- With approval, students may include up to 6 credit hours of elective graduate coursework in closely related disciplines (e.g., Mathematics and Statistics, Bioinformatics and Computational Biology, Electrical and Computer Engineering)

7.2 M.S. in Software Engineering

Students in Saint Louis University’s master’s program in software engineering gain knowledge, skills, and experience in developing high-quality, large-scale software systems. They will learn to use critical design strategies to allow for continued innovation throughout their careers.⁷

Graduates of this program will be able to:

1. Design, implement, evaluate and test a complex software system that meets a given set of computing requirements,
2. Utilize project management processes and tools through the complete software life cycle.
3. Assess relevant literature and technical documents in the field of computing,
4. Communicate effectively to both professional and general audiences in both oral and written forms,
5. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles,
6. Function effectively as a member of a team in developing computing technology and solving technical problems.

The Master of Science degree in Software Engineering requires a minimum of 30 credit hours beyond a Bachelor’s degree, broken down as follows:

Required by MS-SE	
CSCI 5030: Principles of Software Development	3
CSCI 5050: Computing and Society	3
CSCI 5300: Software Engineering	3
Three additional software engineering courses (CSCI 5301-5399)	9
Additional CS course electives (CSCI 5090-5930)	9
CSCI 5960: SE Capstone project	3

Additional notes:

- The “Additional CS course electives” can include additional courses in software engineering.
- Students may apply at most 3 credit hours of Internship with Industry (CSCI 5910) or a maximum of 3 credit hours of Research Topics (CSCI 5970) toward the degree requirements. See §8.6 below for policies and procedures related to internships.

⁷The department is currently considering sunsetting the M.S. program in Software Engineering.

7.3 M.S. in Artificial Intelligence

Saint Louis University’s master’s program in artificial intelligence prepares students to apply artificial intelligence methods, both efficiently and ethically, in order to solve difficult problems and impact the well-being of society.

Graduates of the program will be able to:

1. Select the most appropriate choice among artificial intelligence methods for solving a given problem,
2. Design an experiment to evaluate the quality of a machine learning model and predict its accuracy in a solution environment,
3. Apply techniques from artificial intelligence to solve complex problems in an application domain,
4. Design and implement a software solution that meets a given set of computing requirements,
5. Make informed and ethical decisions regarding the impact of artificial intelligence technologies,
6. Assess literature and technical documents in the fields of artificial intelligence and machine learning,
7. Effectively communicate methods and results to both professional and general audiences in both oral and written form.

The Master of Science degree in Artificial Intelligence requires a minimum of 30 credit hours beyond a Bachelor’s degree, broken down as follows:

Additional notes:

- The AI Foundations and Applications courses must be chosen from a specified list of courses. An up-to-date list can be found here:
<https://cs.slu.edu/academics/graduate/ms-ai>.
- Students may apply up to 6 credit hours of “AI Supporting courses” toward the degree. AI Supporting courses must serve one of three purposes: (1) provide knowledge in a specific domain area that prepares students to apply artificial intelligence or machine learning to solve problems in that particular domain; (2) provide richer foundational knowledge in a supporting area (e.g. algorithms, statistics) that prepares students to understand, enhance, or implement artificial intelligence techniques; (3) provide exploration of the broader impacts of artificial intelligence. The full list of approved courses is maintained by the Computer Science Department. Students may enquire with the Graduate Director about particular courses.
- Students may apply at most 3 credit hours of Internship with Industry (CSCI 5910) or a maximum of 3 credit hours of Research Topics (CSCI 5970) toward the degree requirements. See §8.6 below for policies and procedures related to internships.

Required by MS-AI	
CSCI 5030: Principles of Software Development	3
CSCI 5050: Computing and Society	3
CSCI 5740: Introduction to Artificial Intelligence	3
CSCI 5750: Introduction to Machine Learning	3
CSCI 5961: AI Capstone Project	3
AI Foundations course	3
AI Applications course	3
Additional AI electives	6
Thesis Option	
CSCI 5990 Thesis Research	6
Non-Thesis Option	
Additional Foundations or Applications	3
AI Capstone	3

7.4 M.S. in Bioinformatics and Computational Biology

The Master of Science in Bioinformatics and Computational Biology program brings together expertise from across Saint Louis University in biology, chemistry, computer science, mathematics and statistics, biochemistry and molecular biology.

Graduates of the program will be able to:

1. Design and implement *in silico* experiments for biological problems,
2. Apply and combine existing tools for processing and analysis of biological data sets,
3. Use small- and large-scale quantitative data sets to model complex biological systems,
4. Work as part of multidisciplinary teams in corporate or academic environments,
5. Effectively communicate research approaches and findings.

The Master of Science degree in Bioinformatics and Computational Biology requires a minimum of 30 credit hours beyond a Bachelor's degree, broken down as follows:

7.5 Ph.D. in Computer Science

Graduates of the Ph.D. program will be able to:

1. Demonstrate the use of computing systems, theory and software engineering to solve theoretical and applied problems,
2. Utilize state-of-the-art techniques in their research area to solve open problems,
3. Conduct independent, high quality, innovative research in computer science,

Required by MS-BCB	
BCB 5200: Introduction to Bioinformatics I	3
BCB 5250: Introduction to Bioinformatics II	3
BCB 5300: Algorithms in Computational Biology	3
BCB 5810: Bioinformatics Colloquium	1
BIOL 5030: Genomics	3
Biology Elective	3
Computer Science Elective	3
Internship/Research Experience	2-3
BCB Electives	8-9

4. Communicate computer science research results effectively in both publication formats and professional presentations,
5. Recognize professional responsibilities and make informed judgements in computing practice based on legal and ethical principles.

The Ph.D. in Computer Science requires a minimum of 41 post-baccalaureate credits, with at least 23 credits of coursework and 12 credits of dissertation research.

Required by PhD-CS	
CSCI 5030: Principles of Software Development	3
CSCI 5050: Computing and Society	3
CSCI 5090: Computer Science Colloquium	2
At least one Software Engineering course	3
At least one Systems course	3
At least one Theory course	3
Additional CSCI electives	12
CSCI 6990: Dissertation Research	12

The Ph.D. program has a number of additional non-course requirements for graduation:

- The student must write a dissertation that makes an original and independent research contribution in Computer Science, and must defend the dissertation in a public forum; see §9.4 for further details.
- A student is required to gain some experience in teaching while in the Ph.D. program. Ideally, this will be satisfied while serving as TA or instructor for a course, but in the case of a student who is an RA, this requirement can also be satisfied by other activities with the approval of the Graduate Director.

- Students must register for Computer Science Colloquium each semester in the program, though only two of those semesters need to be taken for credit with a required presentation.

8 Academic Policies and Procedures

8.1 Student Responsibilities

- Students must maintain a 3.0 GPA to remain in good standing in the graduate program and to be eligible for assistantships. A lower GPA may result in probationary status and/or dismissal from the program due to unsatisfactory academic performance.
- All graduate students are required to enroll each semester until a degree is conferred.
- Students must be aware of University policies governing student registration and graduation requirements.
- If awarded an assistantship, students must comply with all requirements outlined in the Graduate Assistant Manual on the Information for Current Students page of the Graduate Education website: <https://www.slu.edu/academics/graduate/current-students/>.
- Graduate assistants must conscientiously perform duties associated with their assistantship.
- Students engaged in research must put consistent effort into doing good quality research and meet regularly with their mentor to review research progress.
- All students are responsible for ensuring they have met all graduation requirements, and for submitting an application to graduate in a timely manner; see §9.6 below for details.

8.2 Transfer of Credit

If a student wishes to receive credit for graduate-level coursework completed in a non-degree program at another institution, a “Petition for Transfer of Credit” form⁸ must be submitted, accompanied by a transcript documenting the coursework and grade(s), for approval by the Graduate Director and Associate Dean of Graduate Affairs for the College of Arts and Sciences. The grades received must be “B” or better. A maximum of 6 hours may be transferred from another program. Coursework as part of a completed Master’s program or used to fulfill undergraduate degree requirements will not be accepted for transfer credit.

8.3 Coursework at other Universities

Students may enroll in courses at other area universities with the approval of their mentor and the completion of a petition for off-campus enrollment followed by completion of the Inter-

⁸https://www.slu.edu/academics/graduate/current-students/forms-petitions/ge_transfer_of_credit_fillable.pdf

University Registration form, both of which are available from the Office of the Registrar.

8.4 Colloquium

A Graduate/Research Seminar is offered every semester, and features professionals from industry and academia sharing their experiences. Occasionally, we bring in entrepreneurs or SLU students. Their talks are varied and topics can range from their research, their experiences transitioning from school to career, or instructional. The seminar is a great opportunity for students to network and learn from those who have come before them. Graduate students can enroll in the 1 credit hour Colloquium course CSCI 5090 which involves attending the seminar and conducting additional research or writing a short paper about each talk, as specified by the course supervisor. The Colloquium course may be repeated for credit.

8.5 Changing Programs

We make it relatively easy for students to change between the M.S. programs in Computer Science, Artificial Intelligence, and Software Engineering. Students who are considering changing programs should contact the Graduate Director to discuss which courses can be counted toward the new program, and any impact this might have on the student's projected graduation date. Assuming all prerequisites for the new program have been met, the change can be completed formally by submitting a *Petition to Amend the Graduate Program*⁹.

8.6 Internships

As noted above, students working toward the M.S. in Computer Science, Software Engineering, or Artificial Intelligence may apply up to 3 credit hours of Internship with Industry (CSCI 5910) toward their degree requirements.

See §11.5 below for some resources at SLU for helping students find possible internship positions. While the department will do its best to connect you with potential employers, it is ultimately the student's responsibility to find suitable internship opportunities.

In order to ensure the quality of the student learning experience and compliance with accreditation and Department of Labor requirements, students must complete the following steps in order to be registered for CSCI 5910:

1. Complete the College of Arts and Sciences Learning Contract¹⁰ with site sponsor and faculty sponsor.
2. Complete the Internship acknowledgment of risk and release for elective internships.¹¹

⁹https://www.slu.edu/academics/graduate/current-students/forms-petitions/petition_to_amend_grad_program_form.pdf

¹⁰<https://www.slu.edu/arts-and-sciences/pdfs/learningcontract2018.doc>

¹¹Elective Internship Form.

3. Submit your completed contract and acknowledgment/release to artssci@slu.edu at least two weeks prior to start of term (not later than the end of drop/add period for term).

Once your contract and acknowledgment/release are verified by the Dean's office, you will be enrolled by the registrar in your internship course.

Internship work must occur in the same term as the registration for Internship credit. Credit for Internship work (prior or future) outside of the term of registration is not permitted.

After securing appropriate permissions from the department and SLU's International Office, students on F-1 visas can undertake an internship as part of Curricular Practical Training (CPT). Students must have been enrolled full-time in their degree program for at least one academic year before being eligible for CPT. If you are interested in CPT opportunities, the first step is to contact your international advisor, and read through the policies and procedures here: <https://www.slu.edu/international-services/culture/employment/index.php>. The Graduate Director can supply a letter of support for CPT if your proposed internship position has suitable learning outcomes for your degree program.

8.7 Time to Degree (M.S. students)

The maximum time to degree for students in M.S. programs is five years. The time period to degree begins at the start of the academic term when the first course is taken in Classified status. Time to degree limits may be extended by submitting the Petition for Extension for Time to Degree.¹² Extensions are ordinarily granted for a maximum of one calendar year. If approved, up to two extensions beyond the time to degree limit may be allowed.

8.8 Parental Leave

Full-time graduate students in good standing who become the primary caregiver of a newborn or adopted child are eligible for up to six weeks of parental leave. Further details are available here: https://www.slu.edu/academics/graduate/gp_parental_leave_policy.pdf

8.9 M.S. Thesis Guidelines

Master's students engaged in research, and particularly those interested in pursuing a Ph.D. or a career in academia, may optionally choose to write a Master's thesis as part of their degree. Students who complete a thesis should register for six hours of CSCI 5990 Thesis Research as part of their elective requirements, typically 3 hours in each of the student's final two semesters. Students must be in good academic standing, must have completed the equivalent of one full-time semester in the Master's program, and must seek approval of their research supervisor before registering for CSCI 5990.

¹²https://www.slu.edu/academics/graduate/current-students/forms-petitions/ge_petition_for_extension-fillable.pdf

The thesis will be evaluated by a committee of three faculty members, one being the research supervisor. All must be members of the Graduate Faculty. Students should work with their supervisor to select suitable committee members based on the area of research. One of the two may be from outside of the Department of Computer Science. The committee should be finalized by midterm of the first semester in CSCI 5990.

A thesis proposal consisting of a proposed title and 200-250 word abstract must be approved by the committee and submitted to the department's Graduate Director by the end of the first semester in CSCI 5990. Students who have their thesis proposal approved and who make satisfactory research progress will receive a grade of IP ("in progress") for the first semester, and will subsequently be allowed to register for the second semester of CSCI 5990.

Since the second semester is typically the student's final semester in the program, the student should be sure to apply for graduation before the end of the second week of the semester (see §9.6 for more details). In addition, a "thesis proposal form" must be submitted to the Graduate School during the *second* semester in CSCI 5990 (before a date specified by the Graduate School, usually just after midterms). Since the research proposal will have already been approved during the first semester, this form¹³ is a formality, although the student must obtain signatures from all committee members and the department chair or graduate director. After the form is submitted, the Candidacy Advisor will send the "Result Form for a Master's Written Thesis" to the research supervisor which is to be used for final approval of the thesis by the committee. Our department does not require an oral exam at the Master's level, so the corresponding result form for the final oral degree examination does not need to be submitted.

The second semester will typically be devoted to further research and writing of the thesis itself. Since the thesis must be read and approved by all committee members, it is essential that a draft be made available by midterm of the second semester to give the readers time to review the work carefully. Committee members should return their corrections and suggested improvements within two weeks of receiving the draft, in case multiple iterations of editing are required.

The deadline for final approval of the thesis is two weeks before the end of the semester, and is set by the Associate Dean for Graduate Affairs. This is a strict deadline; if the thesis isn't approved by this date, degree conferral will be delayed.

The length of the thesis will depend greatly on the nature of the research, but typical theses in Computer Science will range from between 40 and 100 pages following the required format.

After the final version of the thesis has been approved by the committee, the student should schedule an appointment with the Candidacy Advisor to ensure that the thesis conforms to the university's formatting guidelines¹⁴. Once approved by the Candidacy Advisor, the thesis must then be submitted electronically to UMI/ProQuest for archiving and publica-

¹³<https://www.slu.edu/academics/graduate/current-students/forms-petitions/form-masters-thesis-proposal.docx>

¹⁴https://www.slu.edu/academics/graduate/pdfs/slu_formatting_guide.pdf. A L^AT_EX template is available which conforms to these guidelines.

tion via Dissertation Abstracts International. There is an option to “embargo” the contents of the thesis in case of pending patents or if the research is under review elsewhere. In any case, the electronic submission must be completed before the degree can be conferred.

9 Ph.D. Dissertation Guidelines

All students in the Ph.D. program must write a dissertation that makes an original and independent research contribution to the field of Computer Science.

9.1 Selection of Research Area and Advisor

By the end of their **second semester** in the program, the student must select a research area and a Ph.D. advisor. This selection is formalized by the advisor informing the department leadership.

9.2 Qualifying Depth Exam

This exam assesses the student's depth of knowledge in a designated area of Computer Science and their readiness to undertake doctoral research. A maximum of two attempts is allowed. By the end of their **4th semester** in the program, Ph.D. students must complete their *Qualifying Depth Exam*.

Each committee has the freedom to decide the format of this exam, but it must have a written component. It may include a multi-day take-home exam or an in-class exam on topics selected by the committee e.g., Artificial Intelligence, Bioinformatics, Computer Networks, Cybersecurity, High-Performance Computing, Human-Computer Interaction, Operating Systems, etc. The syllabus and format are designed by faculty members specializing in the subject area. **Students must register for this exam within the first two weeks of the semester that they intend to take the exam.** See Appendix 11.5:

“SLU Computer Science Ph.D. Qualifying Depth Examination Form”.

Failure to complete the qualifying exam will result in dismissal from the Ph.D. program in Computer Science. A committee of at least three members of the Graduate Faculty (including the PhD advisor) will conduct and evaluate the exam. The student, Ph.D. advisor, and Graduate Director should work together to schedule and administer the written exam.

9.3 Qualifying Oral Exam

To move from PhD student to PhD candidate status, students must complete the *Qualifying Oral Exam*. Ideally, candidacy status should be reached by the end of the student's third year (6th semester). The purpose of the Qualifying Oral Exam is to demonstrate the ability to conduct research on a topic chosen by the student and approved by their research advisor. The Qualifying Oral Exam requires the formation of a Qualifying Oral Exam Committee, consisting of at least three members of the Graduate Faculty. This committee serves as a precursor to the dissertation committee. Failure to complete the Qualifying Oral Exam will result in dismissal from the Ph.D. program in Computer Science.

All coursework requirements should be completed by the end of the semester in which the oral component of the exam is given. This exam may only be conducted after the student has successfully passed the Qualifying Depth Exam.

9.3.1 Administrative Requirements

The *Qualifying Oral Exam Form*¹⁵ must be submitted to the Associate Dean for Graduate Affairs **at least two weeks** before the proposed date of the oral exam. The Associate Dean will sign the form and send it to the Ph.D. Candidacy Advisor, who then prepares the Degree Audit form and Oral Exam Result form. The oral exam should not be conducted before the student and Ph.D. advisor receive these forms. After the oral exam, if the committee's decision is *Failing*, *Passing*, or *Passing with Distinction*, the student is notified of the results and is automatically advanced to doctoral candidate status.

The Doctoral Oral Exam requires a committee of five members from the Graduate Faculty, including the student's advisor. Students are encouraged to form this committee with potential members of their future dissertation committee in mind. This committee will evaluate the student's research proposal and assess their readiness for candidacy.

Further details on the school-level Doctoral Oral Exam requirement, including procedural steps, required forms, and timelines, are provided in the SLU Ph.D. process document, "Process for Students Pursuing a Doctor of Philosophy." This document¹⁶ and includes comprehensive guidance on how to navigate the requirements for advancing to doctoral candidacy.¹⁷

9.4 Dissertation Stage

Upon successful completion of the preliminary qualifying exams, students enter the *Dissertation Stage* of the program.

9.4.1 Ph.D. Proposal

The purpose of the Ph.D. Proposal is to provide students with feedback on their proposed thesis research. A Ph.D. proposal must be approved by an official committee, consisting of the Ph.D. Advisor and at least other two committee members. The student must make an oral presentation (Dissertation Prospectus) of their proposed dissertation topic to the committee. The Ph.D. Proposal must be completed ideally one year before the PhD defense but not later than one semester before the final dissertation defense.

9.4.2 Dissertation Committee

As part of the Degree Audit, the student should list their proposed dissertation committee, which consists of at least three members, all of whom are members of the Graduate Faculty of Saint Louis University, and who are familiar with the topic of the dissertation/project. Additional external members are allowed. The chair of the committee is normally the Ph.D.

¹⁵https://www.slu.edu/academics/graduate/pdfs/ge_oral_exam_fillable.pdf

¹⁶<https://www.slu.edu/academics/graduate/current-students/forms-petitions/phd-student-process-current.pdf>

¹⁷SLU Forms refer the Qualifying Oral Exam as "Doctoral Oral Examination".

advisor, but must be a member of the student's major department in any case. The membership of this committee may or may not overlap the membership of the student's previous examination committees.

9.4.3 Final Semester

Students must apply to graduate (see §9.6 below) at the beginning of the semester in which they intend to complete all of the Ph.D. requirements, including the dissertation defense, the format review, and submission of the dissertation to Pro Quest/UMI for electronic archiving.

Since the dissertation must be read and approved by all committee members, it is essential that a draft be made available by midterm of the final semester to give the readers time to review the work carefully. Committee members should return their corrections and suggested improvements within two weeks of receiving the draft, in case multiple iterations of editing are required.

When the doctoral candidate, the dissertation chairperson, and the readers agree that the dissertation is in its final form and ready to be defended, the doctoral candidate should prepare the dissertation according to the most recent Formatting Guide, and then schedule the oral defense.

9.4.4 Oral Defense of the Dissertation

All Ph.D. students must complete a public oral presentation and defense of the dissertation. The date, time, and location of the presentation are determined by the candidate's dissertation committee and the doctoral candidate. The candidate and committee chair must submit the "Notification of Readiness for the Public Oral Defense" form¹⁸, signed by the Dissertation Chairperson, to the Candidacy Advisor at least two weeks in advance of the oral defense date.

The Candidacy Advisor will prepare two Result Forms. One is for the defense of the dissertation and the other is for the dissertation itself.

If the committee's decision is Passing or Passing with Distinction for the defense, the committee chairperson can notify the student of the result. The completed Result Forms are sent to the Candidacy Advisor to convey the result of the defense and acceptance of the dissertation (the Result Form for the dissertation can be delayed until the written dissertation is considered acceptable by the committee).

If the committee's decision is Unfavorable for the defense, the student is notified of the results immediately and a new defense will be scheduled at an appropriate time. A new Notification of Readiness is prepared and will include an outside committee member (a SLU faculty member from another program). This additional committee member will be added to the committee in order to assure that policies and procedures are appropriately followed. The Candidacy Advisor will prepare the Result Form for the second dissertation defense. If at the second defense, the committee's decision is Passing or Passing with Distinction for the defense and the dissertation, the committee chairperson can notify the student of

¹⁸https://www.slu.edu/academics/graduate/pdfs/ge_readiness_fillable.pdf

the result. The Result Forms are sent to the Candidacy Advisor to convey the result of the defense and acceptance of the dissertation. If at the second defense, the committee's decision is Unfavorable for the defense, the student is notified immediately and will need to discuss with the committee chair and Graduate Director the option of defending a third time.

9.4.5 Format Review and Final Submission

After the oral defense of the dissertation, and after all required corrections are made, the student should schedule an appointment with the Candidacy Advisor to ensure that the dissertation conforms to the university's formatting guidelines¹⁹. Once approved by the Candidacy Advisor, the dissertation must then be submitted electronically to UMI/ProQuest for archiving and publication via Dissertation Abstracts International. There is an option to "embargo" the contents in case of pending patents or if the research is under review elsewhere. In any case, the electronic submission must be completed before the degree can be conferred.

9.5 Summary of Ph.D. Milestones

The following is a summary of the deadlines for achieving the various milestones described above. These deadlines are not to be construed as expected times to complete the various milestones, but rather as "worst-case" times. A student in good standing will typically meet these milestones earlier than the bounds specified below.

Ph.D. Timeline

- Qualifying Depth Examination Requirements: at most 4 semesters (2 years)
- Qualifying Oral Exam: at most 6 semesters (3 years)
- Dissertation Prospectus: ideally 8 semesters (4 years)
- Final Dissertation Defense: ideally 10 semesters (5 years)

9.6 Graduation Procedures

Students must apply online for graduation (through MySLU) during the first two weeks of their final semester; applications submitted after the second Friday of the semester will incur a late fee of \$50. Once the application is submitted, the Candidacy Advisor will prepare a degree audit that is sent to the student. The degree audit must be reviewed and signed by the faculty advisor, the Graduate Director, and the Associate Dean for Graduate Affairs by the appropriate deadline for that semester (see the Calendar of Deadlines posted on the Graduate Education website). **It is the student's responsibility to secure the**

¹⁹https://www.slu.edu/academics/graduate/pdfs/slu_formatting_guide.pdf. A L^AT_EX template is available which conforms to these guidelines.

necessary signatures and return the degree audit form in a timely manner. The Graduate Director will offer advice each semester on appropriate courses to maintain progress towards the degree, but ultimately it is the responsibility of the student to ensure that they have met all the requirements for the degree prior to graduation.

9.7 Commencement Ceremonies

Students who graduate with their Master's degree at the end of the fall or spring semester may choose to take part in the university's commencement ceremonies. The schedule of upcoming commencement ceremonies, along with information on how to rent a cap and gown is available from <https://www.slu.edu/commencement/faq.php>. Watch your SLU email closely after submitting your signed degree audit for information on how to RSVP for commencement.

10 Evaluation of Graduate Students

10.1 Definition of Full-time Graduate Students

- All enrolled students holding graduate research assistantships, whether full or partial, are defined as full time students.
- For other students, full-time enrollment is considered 6 credit hours per semester (Fall and Spring).

10.2 Evaluation of Academic Progress and Performance

1. Academic progress — The University allows a maximum of five years to complete a Master's degree, but our department expects completion in a shorter time frame. Full-time students should plan to complete their programs in two years.
2. Students who are supported by graduate research assistantships are automatically considered full-time students. Each student will complete an annual review of their completed and current coursework, internship or assistantship activities, and professional development activities.
3. Graduate Research Assistantships (GRA) — A full assistantship requires up to 20 hours/week dedicated to work for a research project. Partial assistantships have duties that are pro-rated accordingly. Duties for GRA students will be agreed to by both the student and the research mentor. The performance of students who have received a GRA will be evaluated by the research mentor. An award of GRA support for one year does not guarantee that a student will receive the same level of support in the next year.

11 Other University Resources

11.1 Graduate Student Association

The Graduate Student Association (GSA) is the official student organization representing all graduate students at Saint Louis University. The GSA advocates for the needs of graduate students needs and provides professional development opportunities. You can find more information here: <https://www.slu.edu/academics/graduate/graduate-student-association.php>

11.2 Public Safety

Graduate students should take reasonable precautions to ensure their safety while on campus, and while traveling to and from campus, especially at night. The Department of Public Safety (DPS) at the university has a number of officers who patrol campus around the clock. DPS can also provide safety escorts or emergency taxi rides for any student who feels unsafe. For more information, visit <https://www.slu.edu/about/safety/index.php>.

11.3 Libraries

The SLU library provides services to support students in their coursework and research endeavors. Most physical resources (books, journals, etc.) related to Computer Science will be located in Pius XII Memorial Library which is just a short walk from the department in Ritter Hall. The library also has many electronic subscriptions to journals and other databases, and the staff can obtain materials from other libraries through their Interlibrary Loan Service. For more information, see <https://www.slu.edu/library/>.

11.4 Computing Resources

The Department of Computer Science maintains a variety of computing systems that support both teaching and research, including Linux workstations, servers, GPU nodes, a GitLab instance, and a Jupyter server. Detailed information about these systems and how to access them is available on the department website: <https://cs.slu.edu/resources/computing>.

In particular, users of these resources are bound by the university and departmental policies concerning the appropriate use of computing systems; see <https://cs.slu.edu/resources/computing/appropriate-use>.

If you have any questions, problems, or special requests, feel free to contact our system administrator (contact information above in §2).

11.5 Career Services

The university has a Career Services Office that provides students with assistance in their job search, for example, help in writing a résumé or preparing for an interview. In addition,

they maintain a central database of internship and career opportunities submitted known as “Handshake”; it is accessible through MySLU, or by logging in directly at <https://slu.joinhandshake.com/login>.

In addition, the department maintains its own database of internship and career opportunities at this address (SLU login required): <https://sites.google.com/a/slu.edu/computer-science/student-opportunities>.

Appendix A

See below: “SLU Computer Science Ph.D. Qualifying Depth Examination Form”.

SLU Computer Science Ph.D. Qualifying Depth Examination Form (Topic and Format)

The SLU Department of Computer Science Ph.D. Qualifying Depth Examination consists of both a General CS Knowledge Qualification (met by receiving satisfactory grades in required coursework) and a Research Qualification. The specific details about these Qualifications can be found in the Graduate Student Handbook.

This form is to document the topic and format of the Qualifying Depth Exam, agreed upon by the student, their Research Advisor, and the members of their Examination Committee (see the Graduate Student Handbook for the requirements regarding Qualifying Depth Examination Committee Members).

Once you've decided, you should complete this form and have it signed by all members of your Qualifying Depth Examination Committee. This form must be signed by the student and all members of their committee.

Student Name (printed): _____

Research Area: _____

Description: (completed by student)

Use the box below to provide a short description of the topic and format that you and your Research Advisor agreed upon for your Qualifying Depth Exam. This can be brief (a few sentences), but if you require extra space, you may attach additional pages.

Advisor Passing Criteria: (completed by Research Advisor)

Use the box below to clearly describe the criteria that the student must meet to receive a passing grade on their Qualifying Depth Examination. If you require extra space, you may attach additional pages.

Signatures

The student, Research Advisor, Qualifying Examination Committee Members and Department Graduate Coordinator must provide their signatures on this document in order for it to be binding.

_____	_____
<i>Student</i>	<i>Date</i>
_____	_____
<i>Research Advisor</i>	<i>Date</i>
_____	_____
<i>Qualifying Examination Committee Member 1</i>	<i>Date</i>
_____	_____
<i>Qualifying Examination Committee Member 2</i>	<i>Date</i>
_____	_____
<i>Graduate Coordinator</i>	<i>Date</i>

