

ARTIFICIAL INTELLIGENCE, M.S.

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.

This graduate program provides students with a depth of knowledge regarding the models and technologies used to make advances in underlying artificial intelligence and machine learning. Through a partnership with faculty across the University, students may choose to apply these techniques in specialized areas of application such as:

- Autonomous systems
- Bioinformatics
- Data science
- Health outcomes
- Image processing
- Natural language processing

Curriculum Overview

Students in SLU's artificial intelligence degree program engage in the theory of artificial intelligence (AI) and machine learning (ML) and in applying AI/ML in practice, including a culminating research thesis or team-based capstone project. Students also consider important questions regarding the impact of AI on society, implicit bias that may result from AI systems and the ethical development and deployment of technologies.

Graduate Handbook (<https://www.slu.edu/arts-and-sciences/pdfs/computersciencegradhandbook2021.pdf>)

Fieldwork and Research Opportunities

From SLU's location in the Midtown area of St. Louis, our students have access to a strong technology community, operations of many Fortune 500 companies and a vibrant startup community. This provides outstanding opportunities for summer internships, part-time work during the academic year and 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 graduates have worked for smaller companies or even started their own companies.

SLU's campus is within walking distance of the Cortex Innovation Community (<https://cortexstl.org/>), a vibrant 200-acre (and growing) innovation hub and technology district. Cortex is home to SLU's Research Innovation Group (<https://www.slu.edu/research/faculty-resources/research-innovation-group/>), which works on technology transfer and commercial partnerships. Cortex is also home to the weekly Venture Cafe (<https://venturecafestl.org/>), 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 artificial intelligence 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:

- Glassdoor's 50 Best Jobs in America (https://www.glassdoor.com/List/Best-Jobs-in-America-LST_KQ0,20.htm) list for 2021 named data scientist as #2 and machine learning engineer as #17. Other computing jobs in the top 25 include Java developer (#1) enterprise architect (#4), devops engineer (#5), information security engineer (#6), mobile engineer (#8), software engineer (#9), front end engineer (#11), back end engineer (#16), cloud engineer (#23) and UX designer (#24).
- U.S. News 100 Best Jobs (<https://money.usnews.com/careers/best-jobs/rankings/the-100-best-jobs/>) list for 2021 named data scientist as #8. Other computing jobs in the top 100 included software developer (#2), IT manager (#12), information security analyst (#15), computer systems analyst (#47), computer network architect (#51), database administrator (#55), web developer (#59) and computer systems administrator (#86).
- Indeed.com's Best Jobs of 20 (<https://www.indeed.com/lead/best-jobs-2020/>) named software architect as #1 and full stack developer as #2. Also included in the top 25 were Java developer (#7), data scientist (#8), IT security specialist (#9), data engineer (#12) and cloud engineer (#20).

Admission Requirements

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

- 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. International students must also meet the following additional requirements:

- Demonstrate English Language Proficiency (<https://catalog.slu.edu/academic-policies/office-admission/undergraduate/english-language-proficiency/>)
- Financial documents are required to complete an application for admission and be reviewed for admission and merit scholarships.
- Proof of financial support that must include:
 - A letter of financial support from the person(s) or sponsoring agency funding the student's 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 the student's study at the University
- Academic records, in English translation, of students who have undertaken postsecondary studies outside the United States must include:
 - 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
 - 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.

Tuition

Tuition	Total Program Cost
MS Artificial Intelligence	\$42,000

Additional charges may apply. Other resources are listed below:

Net Price Calculator (<https://www.slu.edu/financial-aid/tuition-and-costs/calculator.php>)

Information on Tuition and Fees (<https://catalog.slu.edu/academic-policies/student-financial-services/tuition/>)

Miscellaneous Fees (<https://catalog.slu.edu/academic-policies/student-financial-services/fees/>)

Information on Summer Tuition (<https://catalog.slu.edu/academic-policies/student-financial-services/tuition-summer/>)

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> (<http://www.slu.edu/financial-aid/>).

Learning Outcomes

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

Requirements

Code	Title	Credits
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
Artificial Intelligence Foundations course (p. 2)		3
Artificial Intelligence Applications course (p. 2)		3
Artificial Intelligence Electives (p. 3)		6
Choose the non-thesis or thesis Option		6
<i>Non-thesis Option:</i>		
Additional Foundations or Applications course		
CSCI 5961	Artificial Intelligence Capstone Project	
<i>Thesis Option:</i>		
CSCI 5990	Thesis Research	
Total Credits		30

Artificial Intelligence Foundations

These courses have a primary focus on techniques in artificial intelligence and/or machine learning that have wide application to a variety of domain areas. Students must take at least one such course. The full list of approved courses is maintained by the computer science department and includes:

Code	Title	Credits
CSCI 5730	Evolutionary Computation	3
CSCI 5745	Advanced Techniques in Artificial Intelligence	3
CSCI 5760	Deep Learning	3
STAT 5087	Applied Regression	3
STAT 5088	Bayesian Statistics and Statistical Computing	3

Artificial Intelligence Applications

These courses explore how tools or techniques from artificial intelligence are applied to solve problems in a specific domain area. Students must take at least one such course. The full list of approved courses is maintained by the computer science department and includes:

Code	Title	Credits
BCB 5350	Machine Learning in Bioinformatics	3
BME 5150	Brain Computer Interface	3
CSCI 5070	Algorithmic Fairness	3
CSCI 5570	Machine Learning for Networks	3
CSCI 5830	Computer Vision	3
CSCI 5845	Natural Language Processing	3
GIS 5092	Machine Learning for GIS and Remote Sensing	3
HDS 5330	Predictive Modeling and Machine Learning	3

Artificial Intelligence Supporting Courses

All 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. Students may apply at most six credits of such courses to the degree.

The full list of approved courses is maintained by the computer science department and includes:

Code	Title	Credits
BCB 5200	Introduction Bioinformatics I	3
BCB 5250	Introduction Bioinformatics II	3
CSCI 5100	Algorithms	3
CSCI 5530	Computer Security	3
CSCI 5550	Computer Networks	3
CSCI 5610	Concurrent and Parallel Programming	3
CSCI 5620	Distributed Computing	3
CSCI 5710	Databases	3
CSCI 5910	Internship with Industry	1-3
CSCI 5970	Research Topics	1-3
CSCI 5980	Graduate Reading Course	1-3
ECE 5153	Image Processing	3
ECE 5226	Mobile Robotics	3
LAW 8235	Information Privacy Law	2-3
PSY 5120	Memory & Cognition	3
SOC 5670	Spatial Demography – Applied Spatial Statistics	3

Artificial Intelligence Electives

The remaining electives can be taken from any of the foundations, applications or supporting categories.

Foundational Coursework

Students without a previous degree in Computer Science or a closely related field may be required to take additional courses to satisfy prerequisites. Typically, this will not impact time to degree.

Non-Course Requirements

All graduate degree candidates must complete an exit survey with the department during their final semester.

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.

Course	Title	Credits
Year One		
Fall		
CSCI 5030	Principles of Software Development	3
CSCI 5740	Introduction to Artificial Intelligence	3
CSCI 5750	Introduction to Machine Learning	3
Credits		9
Spring		
CSCI 5050	Computing and Society	3
Artificial Intelligence Foundations (p. 3)		3
Artificial Intelligence Applications (p. 3)		3
Credits		9
Year Two		
Fall		
Additional course in either Artificial Intelligence Foundations or Applications		3
Artificial Intelligence Elective (p. 4)		3
Credits		6
Spring		
CSCI 5961	Artificial Intelligence Capstone Project	3
CSCI 5750	Introduction to Machine Learning	3
Artificial Intelligence Elective (p. 4)		3
Credits		9
Total Credits		33

Artificial Intelligence Foundations

Code	Title	Credits
CSCI 5730	Evolutionary Computation	3
CSCI 5745	Advanced Techniques in Artificial Intelligence	3
CSCI 5760	Deep Learning	3
STAT 5087	Applied Regression	3
STAT 5088	Bayesian Statistics and Statistical Computing	3

Artificial Intelligence Applications

Code	Title	Credits
BCB 5350	Machine Learning for Bioinformatics	3
BME 5150	Brain Computer Interface	3

CSCI 5070	Algorithmic Fairness	3
CSCI 5570	Learning and Inference in Networking	3
CSCI 5570	Machine Learning for Networks	3
CSCI 5830	Computer Vision	3
CSCI 5845	Natural Language Processing	3
GIS 5092	Machine Learning for GIS and Remote Sensing	3
HDS 5330	Predictive Modeling and Machine Learning	3

Artificial Intelligence Supporting Courses

Code	Title	Credits
BCB 5200	Introduction Bioinformatics I	3
BCB 5250	Introduction Bioinformatics II	3
CSCI 5100	Algorithms	3
CSCI 5530	Computer Security	3
CSCI 5550	Computer Networks	3
CSCI 5610	Concurrent and Parallel Programming	3
CSCI 5620	Distributed Computing	3
CSCI 5710	Databases	3
CSCI 5910	Internship with Industry	1-3
CSCI 5970	Research Topics	1-3
CSCI 5980	Graduate Reading Course	1-3
ECE 5153	Image Processing	3
ECE 5226	Mobile Robotics	3
LAW 8235	Information Privacy Law	2-3
PSY 5120	Memory & Cognition	3
SOC 5670	Spatial Demography – Applied Spatial Statistics	3

Artificial Intelligence Electives

The remaining electives can be taken from any of the foundations, applications or supporting categories.

Contact Us

For questions about admissions, applicants currently in the United States should contact graduate@slu.edu and applicants elsewhere should contact globalgrad@slu.edu.

For other questions about the program or curriculum, contact the Computer Science department at cs@slu.edu.