

ARTIFICIAL INTELLIGENCE, M.S.

Saint Louis University's Master of Science 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 SLU 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.

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 hub. 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 to 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/>), 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.

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:

- U.S. News 100 Best Jobs (<https://money.usnews.com/careers/best-jobs/rankings/the-100-best-jobs/>) list for 2024 named data scientist as #8. Other computing jobs in the top 100 included software developer (#3), IT manager (#4), information security analyst (#7), web developer (#21), computer systems analyst (#61), computer network architect (#77).
- U.S. Bureau of Labor Statistics (<https://www.bls.gov/ooh/fastest-growing.htm>) lists data scientist as the occupation with the third-highest projected growth through 2032. Other computing jobs ranked in the top 20 include information security analyst (#5), software developer (#10), computer and information research scientists (#13).
- Glassdoor's 50 Best Jobs in America (https://www.glassdoor.com/List/Best-Jobs-in-America-LST_KQ0,20.htm) list for 2022 named data scientist as #3 and machine learning engineer as #6. Other computing jobs in the top 25 include enterprise architect (#1), Java developer (#9), devops engineer (#4), information security engineer (#15), software engineer (#8), back-end engineer (#11), cloud engineer (#12) and UX designer (#24).

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 Saint Louis University admission policies and requirements for domestic students apply to international students. International students applying to SLU must also meet the following additional requirements:

- Demonstrate English language proficiency (<https://catalog.slu.edu/academic-policies/office-admission/undergraduate/english-language-proficiency/>)
- Academic records must include an English translation. Unofficial copies may be accepted in some cases for initial admission review, however official copies must be received prior to enrollment. Course-by-course transcript evaluations are accepted.

Students must submit financial documents to be issued an I-20 for their F-1 visa application. Proof of financial support 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

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, contact the Office of Student Financial Services (<https://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

A grade of C- or higher in a course is required to satisfy any degree requirement.

A grade of B- or higher in a course is required to use that course as a prerequisite for another.

Code	Title	Credits
Artificial Intelligence Foundations		0-7
Students who do not have a 4-year degree in Computer Science must complete an additional 7 credits of coursework		
CSCI 5010	Object-Oriented Programming & Data Structures	
CSCI 5011	Object-Oriented Programming & Data Structures Lab	
CSCI 5020	Object-Oriented Software Design	
Required Courses		
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 Principles course (p. 2)		3
Artificial Intelligence Applications course (p. 3)		3
Artificial Intelligence Electives (p. 3)		6
Choose the Thesis or Non-Thesis Option		6
<i>Thesis Option:</i>		
CSCI 5990	Thesis Research (6 credits)	
<i>Non-Thesis Option:</i>		
Additional Principles or Applications course (3 credits)		
CSCI 5961	Artificial Intelligence Capstone Project (3 credits)	
Total Credits		30-37

At most 3 credit hours of CSCI 5910 Internship with Industry (1-3 cr) will be counted towards the degree.

At most 3 credit hours of CSCI 5970 Research Topics (1-3 cr) will be counted towards the degree.

At most 3 credit hours of CSCI 5980 Graduate Independent Study in Computer Science (1-3 cr) will be counted towards the degree.

At most a total of 6 credit hours of CSCI 5970 Research Topics (1-3 cr), CSCI 5980 Graduate Independent Study in Computer Science (1-3 cr) and CSCI 5990 Thesis Research (0-6 cr) will be counted towards the degree.

Artificial Intelligence Principles

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
CSCI 5770	Big Data Analytics	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
BCGB-5200	Introduction Bioinformatics-I	3
BCGB-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 Independent Study in Computer Science	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

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 Electives

The remaining electives can be taken from any of the AI Principles attributed courses, the AI Applications attributed courses, or by an AI Supporting Courses:-

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

Code	Title	Credits
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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 Principles		3
Artificial Intelligence Applications		3
Credits		9
Year Two		
Fall		
Additional course in either Artificial Intelligence Principles or Applications		3
Artificial Intelligence Elective		3
Credits		6
Spring		
CSCI 5961	Artificial Intelligence Capstone Project	3

Artificial Intelligence Elective	3
Credits	6
Total Credits	30

MS AI + Foundations

Students who do not have a four-year degree in computer science must complete an additional seven credits of coursework.

Course	Title	Credits
Year One		
Fall		
CSCI 5010	Object-Oriented Programming & Data Structures	3
CSCI 5011	Object-Oriented Programming & Data Structures Lab	1
CSCI 5050	Computing and Society	3
CSCI 5710	Databases	3
Credits		10
Spring		
CSCI 5020	Object-Oriented Software Design	3
CSCI 5740	Introduction to Artificial Intelligence	3
CSCI 5750	Introduction to Machine Learning	3
Credits		9
Year Two		
Fall		
CSCI 5030	Principles of Software Development	3
Artificial Intelligence Principles		3
Artificial Intelligence Applications		3
Credits		9
Spring		
CSCI 5961	Artificial Intelligence Capstone Project	3
Artificial Intelligence Elective		3
Artificial Intelligence Principles or Applications		3
Credits		9
Total Credits		37

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.