DATA SCIENCE, B.S.

The Saint Louis University Bachelor of Science in Data Science is an interdisciplinary program supported by the Department of Computer Science (https://www.slu.edu/science-and-engineering/academics/computer-science/) and the Department of Mathematics and Statistics (https://www.slu.edu/arts-and-sciences/mathematics-statistics/). SLU's curriculum is modeled upon guidelines for undergraduate programs in data science as endorsed by the American Statistical Association's Board of Directors. Classes are small and are taught by enthusiastic instructors.

Curriculum Overview

The B.S. in data science is among the most rigorous degrees offered at SLU. This program combines carefully selected computer science, statistics and mathematics courses with four semesters of practica and capstone experiences. The result is an education rooted in the fundamentals that also provides hands-on experience with cleaning, visualizing, analyzing and reporting on data. Students choose electives within the major to specialize in the computer science or statistical aspects of data science.

Fieldwork and Research Opportunities

Faculty in the data science program do research in machine learning, natural language processing, time series, topological data analysis, and in other areas of statistics, computer science and mathematics.

There are multiple research, internship and consulting opportunities for students in the data science program. Past students have done cross-disciplinary work with ArchCity Defenders, the Department of Sociology, the Department of Languages, Literature and Cultures, the Department of English and the Medical School Liver Center, while others have done work in data science itself, doing research with faculty within the Department of Mathematics and Statistics, the Department of Computer Science, and the Lincoln Lab at MIT, among others.

The SLU Data Science Club allows students to practice their predictive modeling in competitions. Some competitions are hosted by SLU solely for the University's students, while others pit SLU students against students and professionals from across the world.

Careers

The McKinsey Report estimated that the United States would face a shortfall of 140,000 to 190,000 people with deep analytical skills, while also needing 1.5 million managers and analysts with the know-how to make decisions based on the analysis of big data.

The Harvard Business Review calls data scientist "the sexiest job of the 21st century," and Glassdoor has ranked data scientist as the No. 1 overall job in the U.S. in terms of the number of job openings, earning potential and career opportunities rating. Data is produced in many places, and companies need employees who can analyze the data and communicate the results. Students with a B.S. in data science will be well-positioned to work in technology, government, research and consulting fields, among others.

Admission Requirements

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

Saint Louis University also accepts the Common Application.

Freshman

All applications are thoroughly reviewed with the highest degree of individual care and consideration to all credentials that are submitted. Solid academic performance in college preparatory coursework is a primary concern in reviewing a freshman applicant's file.

To be considered for admission to any Saint Louis University undergraduate program, applicants must be graduating from an accredited high school, have an acceptable HiSET exam score or take the General Education Development (GED) test.

Transfer

Applicants must be a graduate of an accredited high school or have an acceptable score on the GED or HiSET.

Students who have attempted fewer than 24 semester credits (or 30 quarter credits) of college credit must follow the above freshmen admission requirements. Students who have completed 24 or more semester credits (or 30 quarter credits) of college credit must submit transcripts from all previously attended college(s).

In reviewing a transfer applicant's file, the Office of Admission holistically examines the student's academic performance in college-level coursework as an indicator of the student's ability to meet the academic rigors of Saint Louis University. Where applicable, transfer students will be evaluated on any courses outlined in the continuation standards of their preferred major.

International Applicants

All admission policies and requirements for domestic students apply to international students along with the following:

- Demonstrate English Language Proficiency (https://catalog.slu.edu/academic-policies/office-admission/undergraduate/english-language-proficiency/)
- All academic records must include an English translation. An official course-by-course transcript evaluation may be required and accepted.

Tuition

Tuition	Cost Per Year
Undergraduate Tuition	$54,760

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 and Financial Aid

There are two principal ways to help finance a Saint Louis University education:

- **Scholarships:** Scholarships are awarded based on academic achievement, service, leadership and financial need.

- **Financial Aid:** Financial aid is provided through grants and loans, some of which require repayment.

Saint Louis University makes every effort to keep our education affordable. In fiscal year 2023, 99% of first-time freshmen and 92% of all students received financial aid (https://www.slu.edu/financial-aid/) and students received more than $459 million in aid University-wide.

For priority consideration for merit-based scholarships, apply for admission by December 1 and complete a Free Application for Federal Student Aid (FAFSA) by March 1.

For more information on scholarships and financial aid, visit the Office of Student Financial Services (https://www.slu.edu/financial-aid/).

Learning Outcomes

1. Graduates will be able to use programming and other computer science skills to analyze and interact with data.
2. Graduates will be able to apply statistics to analyze data sets.
3. Graduates will be able to acquire and manage complex data sets.
4. Graduates will be able to use technical skills in predictive modeling.
5. Graduates will be able to visualize data to facilitate the effective presentation of data-driven insights.

Requirements

Data science students must complete a minimum total of **62 credits** for the major.

Code	Title	Credits
University Undergraduate Core (https://catalog.slu.edu/academic-policies/academic-policies-procedures/university-core/)		**32-35**
Major Requirements		
CSCI 1070	Introduction to Computer Science: Taming Big Data	3
CSCI 1300	Introduction to Object-Oriented Programming	4
CSCI 2100	Data Structures	4
CSCI 4710	Databases	3
CSCI 4750	Machine Learning	3
Mathematics/Statistics Requirements		
MATH 1510	Calculus I	4
MATH 1520	Calculus II	4
MATH 1660	Discrete Mathematics	3
MATH 2530	Calculus III	4
MATH 3110	Linear Algebra for Engineers	3
or MATH 3120	Introduction to Linear Algebra	
STAT 3850	Foundation of Statistics	3
STAT 4870	Applied Regression	3
STAT 4880	Bayesian Statistics and Statistical Computing	3
Data Science Integration Requirements		
DATA 1800	Data Science Practicum I	1
DATA 2800	Data Science Practicum II	1
DATA 4961	Capstone Project I	2
DATA 4962	Capstone Project II	2
Major Electives		12

Select four courses, must include at least two CSCI courses and at least one STAT course, from the following:

CSCI 2300	Object-Oriented Software Design	
CSCI 2500	Computer Organization and Systems	
CSCI 2510	Principles of Computing Systems	
CSCI 3100	Algorithms	
CSCI 3300	Software Engineering	
CSCI 4610	Concurrent and Parallel Programming	
CSCI 4620	Distributed Computing	
CSCI 4740	Artificial Intelligence	
CSCI 4760	Deep Learning	
CSCI 4830	Computer Vision	
CSCI 4845	Natural Language Processing	
STAT 4800	Probability Theory	
STAT 4840	Time Series	
STAT 4850	Mathematical Statistics	
General Electives		**24-27**
Total Credits		**120**

Non-Course Requirements

All School of Science and Engineering B.A. and B.S. students must complete an exit interview/survey near the end of their bachelor's program.

Continuation Standards

Students must have a minimum of a 2.00 cumulative GPA in data science major courses by the conclusion of their sophomore year, must maintain a minimum of 2.00 cumulative GPA in these courses at the conclusion of each semester thereafter, and must be registered in at least one data science course counting toward their major in each academic year (until all requirements are completed).

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 1070	Introduction to Computer Science: Taming Big Data [†]	3
MATH 1660	Discrete Mathematics	3
MATH 1510	Calculus I (! satisfies CORE 3200) [†]	4
CORE 1000	Ignite First Year Seminar	2
CORE 1500	Cura Personalis 1: Self in Community	1

CORE 1900	Eloquentia Perfecta 1: Written and Visual Communication	3
	Credits	**16**
Spring		
CSCI 1300	Introduction to Object-Oriented Programming [†]	4
MATH 1520	Calculus II [†]	4
DATA 1800	Data Science Practicum I [†]	1
CORE 1600	Ultimate Questions: Theology	3
General Electives		3
	Credits	**15**
Year Two		
Fall		
CSCI 2100	Data Structures [†]	4
MATH 2530	Calculus III	4
CORE 1200	Eloquentia Perfecta 2: Oral and Visual Communication	3
CORE 1700	Ultimate Questions: Philosophy	3
	Credits	**14**
Spring		
STAT 3850	Foundation of Statistics	3
DATA 2800	Data Science Practicum II	1
CSCI Elective		3
MATH 3110	Linear Algebra for Engineers	3
CORE 2500	Cura Personalis 2: Self in Contemplation	0
CORE 3800	Ways of Thinking: Natural and Applied Sciences	3
General Electives		3
	Credits	**16**
Year Three		
Fall		
CSCI 4710	Databases	3
STAT 4880	Bayesian Statistics and Statistical Computing	3
CORE 2800	Eloquentia Perfecta 3: Creative Expression	3
CORE 3400	Ways of Thinking: Aesthetics, History, and Culture	3
General Elective		3
	Credits	**15**
Spring		
STAT 4870	Applied Regression	3
CSCI 4750	Machine Learning	3
CORE 3600	Ways of Thinking: Social and Behavioral Sciences	3
General Electives		6
	Credits	**15**
Year Four		
Fall		
DATA 4961	Capstone Project I	2
CSCI/STAT Electives		6
CORE 3500	Cura Personalis 3: Self in the World	1
General Electives		6
	Credits	**15**

Spring		
DATA 4962	Capstone Project II	2
CSCI/STAT Elective		3
General Electives		9
	Credits	**14**
	Total Credits	**120**

† Students must earn a C- or better.
‡ Strongly recommended for capstone

Program Notes

• STAT 3850 Foundation of Statistics (3 cr) and CSCI 2100 Data Structures (4 cr) are crucial to this program, as they serve as prerequisites for all of the upper division STAT and CSCI courses. As such, they should be taken as soon as reasonably possible.
• Possible STAT electives include STAT 4840 Time Series (3 cr), MATH 4800 Probability Theory (3 cr) and STAT 4850 Mathematical Statistics (3 cr).
• Possible CSCI electives include CSCI 2300 Object-Oriented Software Design (3 cr), CSCI 3100 Algorithms (3 cr), CSCI 3300 Software Engineering (3 cr), CSCI 4610 Concurrent and Parallel Programming (3 cr), CSCI 4620 Distributed Computing (3 cr), CSCI 4740 Artificial Intelligence (3 cr), CSCI 4760 Deep Learning (3 cr), CSCI 4830 Computer Vision (3 cr), and CSCI 4845 Natural Language Processing (3 cr).
• At least one elective must have a STAT designator and at least two electives must have a CSCI designator.
• Twelve hours of CSCI/STAT electives are required.

Madrid

Students can complete all or part of the requirements for the Data Science, B.S. at SLU-Madrid.

Learn More (https://www.slu.edu/madrid/)

2+SLU

2+SLU programs provide a guided pathway for students transferring from a partner institution.

Data Science, B.S. (STLCC 2+SLU) (https://catalog.slu.edu/academic-policies/office-admission/undergraduate/2plusslu/stlcc/data-science/)

Contact Us

For additional information about this program, please contact mathstat@slu.edu or call 314-977-2444.