

DATA SCIENCE, B.S. TO BIOINFORMATICS & COMPUTATIONAL BIOLOGY, M.S. ACCELERATED PROGRAM

Saint Louis University's data science B.S. to bioinformatics and computational biology M.S. accelerated program allows a student to complete both the Bachelor of Science in Data Science and the Master of Science in Bioinformatics and Computational Biology in a shorter time period than if both degrees were pursued independently.

For additional information, see the catalog entries for the following programs:

Data Science, B.S. (<https://catalog.slu.edu/colleges-schools/arts-sciences/interdisciplinary/data-science-bs/>)

Bioinformatics and Computational Biology, M.S. (<https://catalog.slu.edu/colleges-schools/science-engineering/computer-science/bioinformatics-computational-biology-ms/>)

Requirements

Students who want to apply to this accelerated program should have completed all 2000-level coursework required of the data science bachelor's program and have completed at least 75 credits at the time of application.

At the time of application, students must have a cumulative GPA of at least 3.00 and a GPA of at least 3.00 in their computer science coursework. Contact the graduate coordinator for more details.

Non-Course Requirements

All 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 maintain a cumulative GPA of at least 3.00 and a GPA of at least 3.00 in their computer science coursework.

Students who drop below that GPA while in the accelerated program will be placed on a one-semester probationary period before being dismissed from the accelerated program.

Only grades of "B" or better in the graduate courses taken while an undergraduate can be applied to the master's degree.

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 10xx | Introduction to Computer Science [†] | 3 |
| (p. 2) | | |
| MATH 1660 | Discrete Mathematics | 3 |
| University Core and/or General Electives | | 9 |
| Credits | | 15 |
| Spring | | |
| CSCI 1300 | Introduction to Object-Oriented Programming | 4 |
| MATH 1510 | Calculus I | 4 |
| University Core and/or General Electives | | 6 |
| Credits | | 14 |
| Year Two | | |
| Fall | | |
| CSCI 2100 | Data Structures | 4 |
| MATH 1520 | Calculus II | 4 |
| University Core and/or General Electives | | 9 |
| Credits | | 17 |
| Spring | | |
| CSCI 2300 | Object-Oriented Software Design | 3 |
| CSCI 2500 | Computer Organization and Systems | 3 |
| University Core and/or General Electives | | 9 |
| Credits | | 15 |
| Year Three | | |
| Fall | | |
| CSCI 3500 | Operating Systems | 3 |
| Additional Mathematics (2000+) | | 3 |
| University Core and/or General Electives | | 9 |
| Credits | | 15 |
| Spring | | |
| ! Application Course (p. 2) | | 3 |
| ! Theory Course (p. 2) | | 3 |
| PHIL 3050X | Computer Ethics | 3 |
| University Core and/or General Electives | | 6 |
| Credits | | 15 |
| Year Four | | |
| Fall | | |
| CSCI 4961 | Capstone Project I | 2 |
| CSCI 5090 | Computer Science Colloquium | 1 |
| CSCI 51## | CSCI Elective | 3 |
| University Core and/or General Electives | | 9 |
| Credits | | 15 |
| Spring | | |
| CSCI 4962 | Capstone Project II | 2 |
| CSCI 51xx | CSCI Elective | 3 |
| University Core and/or General Electives | | 9 |
| Credits | | 14 |
| Year Five | | |
| Fall | | |
| CSCI 5030 | Principles of Software Development | 3 |

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|-------------------------------|---|------------|
| CSCI 5050 | Computing and Society | 3 |
| CSCI 5090 | Computer Science Colloquium | 1 |
| Theory Elective (p. 2) | Theory courses numbered CSCI5100-5199 | 3 |
| Software Engineering Elective | Software Engineering courses numbered CSCI5300-5399 | 3 |
| Credits | | 13 |
| Spring | | |
| CSCI 5090 | Computer Science Colloquium | 1 |
| CSCI Systems Elective | Systems courses numbered CSCI5500-5599 | 3 |
| Graduate Elective (p. 2) | | 3 |
| Graduate Elective (p. 2) | | 3 |
| Graduate Elective (p. 2) | | 3 |
| Credits | | 13 |
| Total Credits | | 146 |

Introduction to Computer Science

| Code | Title | Credits |
|-----------|--|---------|
| CSCI 1010 | Introduction to Computer Science: Principles | |
| CSCI 1020 | Introduction to Computer Science: Bioinformatics | |
| CSCI 1025 | Introduction to Computer Science: Cybersecurity | |
| CSCI 1030 | Introduction to Computer Science: Game Design | |
| CSCI 1040 | Introduction to Computer Science: Mobile Computing | |
| CSCI 1050 | Introduction to Computer Science: Multimedia | |
| CSCI 1060 | Introduction to Computer Science: Scientific Programming | |
| CSCI 1070 | Introduction to Computer Science: Taming Big Data | |
| CSCI 1080 | Introduction to Computer Science: World Wide Web | |
| CSCI 1090 | Introduction to Computer Science: Special Topics | |

With permission, a computing-intensive course from another discipline may be substituted. Examples of such courses include:

| | |
|-----------|----------------------------------|
| BME 2000 | Biomedical Engineering Computing |
| CVNG 1500 | Civil Engineering Computing |
| STAT 3850 | Foundation of Statistics |

Applied Systems

| Code | Title | Credits |
|-----------|-------------------------------------|---------|
| CSCI 4500 | Advanced Operating Systems | |
| CSCI 4530 | Computer Security | |
| CSCI 4550 | Computer Networks | |
| CSCI 4610 | Concurrent and Parallel Programming | |
| CSCI 4620 | Distributed Computing | |

Theory Courses

| Code | Title | Credits |
|-----------|-----------------------|---------|
| CSCI 3100 | Algorithms | |
| CSCI 3200 | Programming Languages | |

Graduate Electives

The general requirements must include a course from at least two of the following categories:

- CSCI 5200-5299 (Language/Compilers courses)
- CSCI 5600-5699 (Large Scale Systems courses)
- CSCI 5700-5799 (Knowledge Systems)
- CSCI 5800-5899 or BCB 5200/5250 (Advanced Applications)

Program Notes

CSCI 5050 Computing and Society (3 cr) requirement will be waived for students who took Computer Ethics as an undergraduate; these hours would become an additional graduate elective.

Thesis Option

A master's thesis is optional. Students completing a thesis should take six credits of Thesis Research Thesis Research (CSCI 5990) as part of the elective requirements.

Internship with Industry

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

Closely Related Disciplines

With approval, students may include up to six credits of elective graduate coursework in closely related disciplines (e.g. mathematics and statistics, bioinformatics and computational biology, electrical and computer engineering).