

Biological Data Science, MS

ASBDSMS

Are you a data scientist who wants to learn more about biology or a biologist who needs a better grasp of data sets generated in the life sciences? This program is for you. Work with faculty who are passionate about bridging the gap between biology and data science.

Program description

Degree awarded: MS Biological Data Science

The MS degree program in biological data science provides students with a foundation in biology and computational methods along with hands-on training through practical projects at the interface of the natural and mathematical sciences.

Students learn to manipulate big data, including the generation and analysis of data using statistical and computational toolsets. They use their analytical skills in ecological, environmental, toxicological and other biological applications. The program incorporates multiple levels of experiential learning to ensure students gain critical thinking skills in addition to core competencies.

At a glance

- **College/School:** [New College of Interdisciplinary Arts and Sciences](#)
- **Location:** [West Valley](#) or [Online](#)

Accelerated program options

This program allows students to obtain both a bachelor's and master's degree in as little as five years. It is offered as an **accelerated bachelor's plus master's degree** with:

[Applied Computing, BS](#)

[Applied Mathematics, BS](#)

[Biology, BA](#)

[Biology, BS](#)

[Environmental Science, BA](#)

[Environmental Science, BS](#)

[Pharmacology and Toxicology, BS](#)

[Statistics, BS](#)

Acceptance to the graduate program requires a separate application. Students typically receive approval to pursue the accelerated master's during the junior year of their bachelor's degree program. Interested students can learn about eligibility requirements and [how to apply](#).

Degree requirements

32 credit hours and a thesis, or

32 credit hours including the required applied project course (ACO 593, BIO 593 or MAT 593), or

32 credit hours including the required capstone course (LSC 586)

Required Core (12 credit hours)

ACO 501 Database Systems and Problem Solving in Python (3)

LSC 555 Integrative Biology I (3)

LSC 556 Integrative Biology II (3)

LSC 562 Applied Mathematics Techniques in Biology (3)

Other Requirements for Campus Immersion (8 credit hours)

LSC 519 Applied Learning Lab (1)

LSC 540 Statistics for Biological Data Science I (3)

LSC 541 Statistics for Biological Data Science II (3)

LSC 547 Wet Laboratory Experience (1)

Other Requirements for Digital Immersion (14 credit hours)

ACO 580 Practicum Topic: Intro to Python Programming for Problem Solving (3)

LSC 519 Applied Learning Lab (2)

LSC 540 Statistics for Biological Data Science I (3)

LSC 541 Statistics for Biological Data Science II (3)

LSC 585 Capstone I in Biological Data Science (3)

Electives (3 or 6 credit hours)

Culminating Experience (3 or 6 credit hours)

ACO 593 Applied Project (6)

BIO 593 Applied Project (6)

LSC 593 Applied Project (6)

MAT 593 Applied Project (6)

ACO 599 Thesis (6)

BIO 599 Thesis (6)
LSC 599 Thesis (6)
MAT 599 Thesis (6)
LSC 586 Capstone II in Biological Data Science (3)

Additional Curriculum Information

The Master of Science program in biological data science is delivered through the campus immersion or digital immersion modality. Culminating experiences require three or six credit hours with varying options based on modality.

Students in the campus immersion modality select either an applied project or thesis for the culminating experience based on their interests and career goals in biological data science. The applied project option usually results in a written report summarizing the work that was completed. The thesis is best suited for students who want to pursue a research career because it requires an oral defense, and the written thesis is considered a publication. These students complete the courses listed under Other Requirements for Campus Immersion and select six credit hours of electives in consultation with the academic unit.

The capstone course option is reserved for students in the digital immersion modality. These students complete the courses listed under Other Requirements for Digital Immersion and select three credit hours of electives in consultation with the academic unit. The capstone course will incorporate a work-based learning model and provide industry-relevant projects for students.

Courses from the other requirements lists above may be substituted if students receive approval from the academic unit.

Admission requirements

Applicants must fulfill the requirements of both the Graduate College and the New College of Interdisciplinary Arts and Sciences.

Applicants are eligible to apply to the program if they have earned a bachelor's or master's degree in a related field such as biology, mathematics, statistics or computing, as well as unrelated fields from a regionally accredited institution.

Applicants must have a minimum cumulative GPA of 3.00 (scale is 4.00 = "A") in the last 60 hours of their first bachelor's degree program or a minimum cumulative GPA of 3.00 (scale is 4.00 = "A") in an applicable master's degree program.

All applicants must submit:

1. graduate admission application and application fee
2. official transcripts
3. statement of purpose

4. two letters of recommendation
5. professional resume
6. proof of English proficiency

Additional Application Information

An applicant whose native language is not English must provide [proof of English proficiency](#) regardless of their current residency.

It is preferred that letters of recommendation be from faculty members who know the applicant's work well; if these are not available, letters of recommendation from individuals in supervisory or professional roles will be accepted.

The statement of purpose should describe the applicant's educational background, scholarly interests, and academic and professional goals.

Depending on the applicant's educational background, deficiency courses may be required.

Tuition information

When it comes to paying for higher education, everyone's situation is different. Students can learn about [ASU tuition and financial aid](#) options to find out which will work best for them.

Attend online

ASU Online

ASU offers this program in an online format with multiple enrollment sessions throughout the year. Applicants may [view the program's ASU Online page](#) for program descriptions and to request more information.

Career opportunities

The proliferation of big data sets generated in biological science fields has dramatically increased the demand for individuals with the solid skill sets they need to manipulate and interpret this data.

Graduates are ready to enter one of the fastest-growing job markets to work with consulting firms and government agencies as well as nongovernmental organizations, in data science, informatics, data analytics, database development and mathematical modeling of biological systems that are relevant to a variety of industries. They are well suited for employment in positions such as:

- bioinformatics data scientist
- chemical biology data scientist
- clinical data analyst
- computational biologist
- data engineer or data mining engineer

- database developer
- fisheries scientist, dairy scientist or animal scientist
- genomic scientist
- natural resources data scientist
- pharmaceutical scientist

Graduates also are ready to seek advanced professional or graduate degrees, such as in medical, dental, veterinary and public health fields.

Contact information

[School of Mathematical and Natural Sciences](#) | FAB N101

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[Admission deadlines](#)