Biological Data Science, MS

Handbook

ASU New College
of Interdisciplinary Arts and Sciences

Arizona State University

Greetings!

Welcome to the New College of Interdisciplinary Arts and Sciences at Arizona State University.

Your acceptance into our graduate degree program is evidence of your past academic accomplishments and your future potential. It is both an honor and an indication of the hard work and dedication you have invested into your education. Congratulations! Chances are you probably have questions, answers for most of which you will find throughout this handbook. But there are at least two questions I want to address here. First, "for how long will New College be new?" New College will always be New! That's because New is not measured on a stopwatch or even a calendar. New is a mindset to never settle for the status quo, but instead continue to push the bounds of knowledge and understanding.

The next most-often question I receive is, "what is Interdisciplinary?" The dictionary tells us interdisciplinary involves two or more disciplines. We put that in practice in New College by building degree programs that break down the silos between traditional academic disciplines. Your studies will likely include courses offered across our four unique schools.

Please know, starting a graduate degree program is a huge next step in your life – and I want you to know that throughout your journey with New College, all of us are ready to help you through every phase. If your schedule allows, I invite you to visit our beautiful campus at any point during your studies. Come meet your faculty and advisors. I would sincerely appreciate meeting you as well. Looking ahead, when you graduate, please consider joining us in person for commencement, convocation, and our special New College reception just for online students.

We are thrilled you have chosen New College to pursue your graduate degree and we commit to being here with you every step of the way.

Sincerely,

Todd R. Sandrin, Ph.D.
Dean, New College of Interdisciplinary Arts and Sciences
Vice Provost, West Valley campus
Professor, School of Mathematical and Natural Sciences
Senior Global Futures Scientist - Julie Ann Wrigley Global Futures Laboratory

Contents

Overview

ASU Charter

ASU is a comprehensive public research university, measured not by whom we exclude, but rather by whom we include and how they succeed; advancing research and discovery of public value; and assuming fundamental responsibility for the economic, social, cultural and overall health of the communities it serves.

Visit ASU Charter, Mission and Goals for more information.

Welcome

Welcome to Arizona State University's Master of Science program in Biological Data Science (BDS). We have designed this program to give our students a strong, inquiry-based foundation in the key areas needed in data science and its biological applications. Our program emphasizes real-world training 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. Students will 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 on top of core competencies. Students will be ready to enter one of the fastest-growing job markets, work with consulting firms and government agencies as well as non-governmental organizations, or pursue advanced professional or graduate degrees.

This is a two-year full-time program that requires 32 credit hours. During the first year, students take 2 biology classes, 2 statistics classes, 1 class in each of math, databases and programming, laboratory experience, and a practical applications lab focused on high performance computing and technical writing. The second year focuses on electives to further explore data science topics and the completion of a thesis or applied project under the supervision of an interdisciplinary team of 2-3 faculty (the thesis is highly recommended for students seeking admission to a doctoral program). We also encourage our students to attend major conferences in their desired areas to present research findings.

Arizona State University comprises sixteen colleges and schools spread across four campuses in the Phoenix, Arizona metropolitan area. The MS program in Biological Data Science is offered by the School of Mathematical and Natural Sciences, which is part of the New College of Interdisciplinary Arts and Sciences, and is housed on ASU's West Valley Campus in Glendale, AZ.

If you have any questions about our program, feel free to contact program director Dr. Nilesh Dixit at Nilish.Dixit@asu.edu.

Quick Facts

Program location: West Valley campus
Start terms: Fall A/C
Time to completion: 24 Months
Schedule: Evening

Student Support & Academic Advising

Mentoring

Given the training model of the Thesis and Applied Project tracks, graduate students in those tracks should take advantage of the mentoring provided by their supervisory committee chair. Mentoring involves many activities, ranging from development of a course plan to meet one's career goals, development of skills related to teaching and research and the provision of constructive feedback related to these domains, and consultation on professional issues and career development.

At a minimum, a graduate student should expect the following from their supervisory committee chair:

- development of goals/objectives for a specified time period
- availability for periodic meetings
- provision of regular and constructive feedback regarding student progress
- any other responsibilities stipulated by program policy or the Graduate Handbook

However, it is important to keep in mind that mentoring involves a relationship; thus, it is the responsibility of the graduate student to seek out these mentoring activities and to follow through in a timely fashion with any activities agreed upon. Newly admitted students are encouraged to schedule an appointment with the program director to identify potential mentoring possibilities. If problems arise in a student's mentoring relationship or with any other faculty member, the graduate student should arrange a time to discuss the problem with the Program Director.

Staff Advisor

The New College Graduate Staff Advisor, also known as the Academic Success Coordinator, provides general advising designed to direct the student to courses and faculty who could best meet their academic and professional interests. The Graduate Staff Advisor is available to assist students in the development and completion of the interactive Plan of Study (iPOS). For Graduate Staff Advisor questions call 602-543-3000 or email NCGradAdvising@asu.edu. Click here to schedule an appointment online.

My ASU Portal

On your My ASU portal you will find information about your courses, transcripts, transportation, student success and support, finances, university policies and the academic calendar. You can familiarize yourself with these resources here.

Student Responsibility

As a graduate student, you're responsible for reviewing and adhering to all university, college, and graduate college policies and procedures.

- Review this program handbook and communicate with your academic success team about any questions.
- Review your program website to ensure you have information related to course registration and course sequencing.
- Check your ASU email daily and review all messages from your New College Graduate Student Services team.
- Monitor your My ASU account regarding your status, holds, action items and other important information to ensure you're on track for your degree.

Admissions

Application Requirements & Deadlines

Admission to the MS Biological Data Science – West Valley campus program is offered for the Fall A/C (August) semester start. Completed admission files are reviewed on a rolling basis. Admission decisions are typically made within ten business days. Applicants are encouraged to apply early and have all application materials on file with ASU no later than July 15th of each year for the upcoming Fall semester start.

The Graduate College at ASU maintains a minimum requirement of admission to master's, certificate and doctoral programs. These minimum requirements can be reviewed on the ASU Graduate Admission site. Each degree program also establishes specific admission requirements. Please visit ASU Degree Search for details on application requirements. Applicants must fulfill the requirements of both the Graduate College and the New College of Interdisciplinary Arts and Sciences.

Application deadlines for New College graduate degree programs can be found online here.

Admissions Contact Information:

- Current Applicants: ncgradadmissions@asu.edu

Investment and Funding

Tuition and Fees

All amounts shown in the Tuition and Fees Schedules or in other University publications or web pages represent tuition and fees as currently approved. However, Arizona State University reserves the right to increase or modify tuition and fees without prior notice, upon approval by the Arizona Board of Regents or as otherwise consistent with Board policy and to make such modifications applicable to students enrolled at ASU at that time as well as to incoming students.

To view current year tuition, program fees, other fees, please visit the Tuition and Cost Calculator.

To view historical information about tuition and fees, please visit Tuition and Fees Schedule.

Financial Aid and Scholarship Services

For information on investing in your graduate degree visit Financial Aid and Scholarship Services online.

Current or incoming ASU students can call 24/7 at 855-278-5080.

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Funding resources:

1.Graduate College University Grant (GCUG): This is a need-based award to support new and continuing masters and doctoral students with financial need as determined by information taken from the FAFSA. The GCUG is intended to support in recruitment and retention of outstanding graduate students at Arizona State University. Students may receive this award for a maximum of four semesters throughout their degree study. Students must be nominated by their academic unit.

2.Course Assistant Positions: The availability of these positions may vary each academic year. These positions are intended for first- or second- year BDS students to assist with undergraduate courses within the School of Mathematical and Natural Sciences. Courses may be offered over a full semester (15 weeks, session C), or over 7.5 weeks (session A or B). Stipends for these positions vary according to the number of hours per week required by the instructor of record. Contact the BDS director to learn more about these positions.

4.Research Assistant Funding: On occasion, faculty may have funds to hire Master's-level students as graduate assistants. These would typically be advanced (second-year) students who are involved in grant-funded projects.

Program Requirements

Degree Requirements

The MS Biological Data Science – West Valley campus degree requires 32 credit hours including 6 credit hours of culminating experience.

The training students receive spans statistics, computing, mathematics, and biology. It is expected that the culminating experiences will be interdisciplinary involving biology and at least one of the other data science areas. Thus, students should choose a lead advisor and committee members with expertise that reflect the interdisciplinarity of the thesis or project.

Visit ASU Degree Search for more information.

Course Descriptions

Required Core (12 credit hours):

ACO 501 Database Systems and Problem Solving in Python (3): Design and implementation of databases for scientific applications. Defining and querying database systems using the SQL industry standard language. Data exchange using XML. Programming in Python to solve realistic problems using scientific data.

LSC 555 Integrative Biology I (3): Provides a comprehensive understanding of the human genome, recent developments, next generation sequencing techniques including the preparation of DNA samples as well as principles of the new generation sequencing assay formats. Describes, critically evaluates and applies theoretical perspectives within genetic/genomic studies, develops and uses computational and mathematical tools and of the invaluable lines of inquiry these biomedical investigations may portend.

LSC 556 Integrative Biology II (3): Provides a survey of fundamental issues in organismal biology. Covers biological diversity, relationships between form and function, processes of growth and development in individuals and populations, biomes and organism-environment relationships, populations and ecosystem function. Weaves components of previous course work throughout this course where possible.

LSC 562 Applied Mathematics Techniques in Biology (3): Population dynamics, molecular interactions, population genetics, and other biological applications motivate the discrete and continuous mathematics. Studies mathematical techniques and applications representative of a range of applied mathematics topics. Incorporates computer software to help with visualization and numerical solutions of some of the problems.

<u>Other Requirements for Campus Immersion (8 credit hours):</u>

LSC 547 Wet Laboratory Experience (1): Balances the need for bench work and in silico experience for students interested in pursuing a career with learning important statistical and computational tools to analyze biological data. Under the direct supervision of the PI and/or Laboratory Manager, students receive instruction and perform all experiments as specified in the performance objectives for the course.

LSC 540 Statistics for Biological Data Science I (3): Statistical concepts and fundamental methods applicable to biological data science. Emphasis is placed on the practical application to biological contexts and communication of results, using data science software such as R and/or Python. Statistical concepts and methodologies including hypothesis testing, confidence intervals, correlation, probability, analysis of variance, chi-squared tests and linear regression will be explored within biological and life science contexts.

LSC 541 Statistics for Biological Data Science II (3): This second course in statistics covers both classical and modern statistical tools for biological data analyses. The course is divided into five modules: (1): one and two-variable analysis; (2) multivariate analysis; (3) design of experiments (4) introduction of longitudinal and survival analysis.; (5) modern computer intensive analysis methods. For each statistical method, students will learn the rationale behind the method and how to implement the method using statistical software (primarily R and/or Python).

LSC 519 Applied Learning Lab (1): Workshop-style course where students learn to use ASU's high-performance computing cluster, manipulate files from the Unix command line, and write scripts for the Unix shell and in R for data analysis. Students will be introduced to a variety of research areas in Biological Data Science and will review the requirements for their culminating experience. Additional topics include best practices for written and oral scientific communication.

<u>Electives (5 - 6 credit hours):</u>

See Additional Curriculum Information and Approval for Credit taken Outside the Program below and listed in the graduation checklist.

Additional Curriculum Information
Other requirements as well as elective and research coursework must be approved by the program director. Students should consult their faculty advisor, also known as the supervisory committee chair, and the BDS graduate staff advisor (NCGradAdvising@asu.edu) for the approved electives and research course list.

Approval for Credit taken Outside the Program

Before taking courses outside the program students should confer with the Director of BDS to determine if the course is appropriate for inclusion on the interactive plan of study (iPOS – see details in the Plan of Study section). This will involve sharing the following with the Director of BDS:

- a brief description of why the course is relevant to your iPOS

- the course prefix and number
- the course title
- the course catalog description

In instances where this information is not substantial enough to make a determination regarding the course, the student may be asked to solicit and provide a sample syllabus from the course. Once the Director of BDS has approved the course, the student may enroll and include it in the iPOS.

Transfer Credit

Students may transfer up to 6 credit hours of coursework taken before beginning the program (referred to as pre-admission credits). Pre-admission credit hours must be approved by the degree program and the Graduate College office. Students are responsible for alerting their faculty and staff advisors that they plan on transferring in credits.

To qualify for pre-admission credits, the courses must meet specific criteria:

- Be graduate-level
- Have been taken within three years of admission to the ASU degree program.
- A grade of "B" or better must have been earned
- Must not have been used towards a previous degree
- Completed at a regionally accredited US institution or international institution officially recognized by that country.

Certain types of graduate credits cannot be transferred to ASU, such as courses taken at a non-collegiate institution, institutions that lack regional accreditation, for life experience, continuing education programs, workshops, etc. Students must officially transfer in pre-admission credit hours through the iPOS system for approval by the staff advisor, supervisory committee chair, program director, and the Graduate College office. Official transcripts from where the pre-admission credits were earned must be sent to Graduate Admission Services.

Culminating Experience (6 credit hours):

The MS Biological Data Science West Valley campus program requires students choose one culminating experience option (either a research thesis or applied project) based on their emphasis area in biological data science.

ACO/BIO/LSC/MAT 599 Thesis (6):

A Master's Thesis is a written report of an empirical research project. The content and scope of the thesis research is to be approved by the student's supervisory committee chair. The final thesis document must then be defended before the supervisory committee chair and two additional committee members. While Master's-level projects are not expected to be fully independent of an advisor's research, it is expected that each student will have made a substantive contribution to all aspects of the thesis research, and will be the sole author of the thesis document submitted to the committee for defense.

The general format of the thesis document is set by ASU and is somewhat different than a typical research report or paper. Thesis documents must be reviewed and approved by the university prior to final submission. See https://graduate.asu.edu/current-students/completing-your-degree/formatting-your-thesis-or-dissertation for formatting details and a template. Aside from the requirements set forth in the format manual, the thesis document should use APA style or a discipline-specific style, and generally include an introduction, methods section, results section, and discussion/conclusions. It is to your benefit to work closely with your supervisory committee chair while writing the thesis document.

Once the thesis document is complete, it must be "defended" before a committee consisting of the student's supervisory committee chair and two additional committee members. The student may choose the other two members of the committee with the approval of the supervisory committee chair. It is best to approach prospective committee members early in the process. Members of the thesis committee should be identified by the end of the first year in the program and approved by submitting the iPOS.

Thesis projects are typically started in the Fall semester of a student's second year in the MS program. Projects must be defended several weeks before the end of the student's final semester. A thesis defense is typically 1-2 hours long and involves a presentation followed by questioning by the thesis committee (the specific format for the defense is up to the supervisory committee chair). Thesis defenses are required to be open to the public and the dates/times/locations of defenses are listed on the ASU website. At the conclusion of the defense, students will be asked to leave the room while the thesis committee deliberates. The committee is given the option to pass the student, fail the student, or pass the student pending some revisions to the thesis document.

The timeline for completing and defending a Master's thesis project is dictated by ASU's Graduate College office (see https://graduate.asu.edu/current-students/policies-forms-and-deadlines/graduation-deadlines for specific deadlines).

Failure to meet these deadlines will delay graduation.   Further details about ASU's thesis rules can be found in the Graduate Policies and Procedures Handbook at https://graduate.asu.edu/current-students/policies-forms-and-deadlines/policy-manuals.

ACO/BIO/LSC/MAT 593 Applied Project (6):

An "Applied Project" is an alternative to a Master's thesis. There are no specific rules about the scope or content of applied projects. An applied project is scholarly work that spans two aspects of biological data science, and may take the form of a research proposal, literature review, program analysis, or some other research that is supervised by a student's faculty advisor. The project utilizes at least one data science skill/tool to explore a research question within the biological sciences. Data science tolls/skills include but are not limited to: statistical data analysis, database design, software development, meta-analysis, and mathematical/computational modeling. Applied Projects must be approved by a student's supervisory committee chair and one additional faculty member by the end of the final exam period that concludes a student's final semester in the program. Students should plan to submit their applied project document to the supervisory committee chair well in advance of this deadline.

Research and Culminating Experience Eligibility and Registration

Research

To receive the override to enroll in the first semester of research 592 credit hours the student must complete the online [individualized instruction form](https://newcollege.asu.edu/advising/graduate/iiform) at https://newcollege.asu.edu/advising/graduate/iiform.

Culminating Experience

The culminating experience is completed in a student's final year of study. To be eligible for an override to enroll in the either 593 or 599 a student must:

- Have an approved iPOS with no course errors
- Resolve all items listed under Priority Tasks affecting registration in the My ASU Portal
- Meet the minimum 3.00 GPA in each Plan of Study GPA, Overall Graduate GPA, Cumulative GPA.

To receive the override to **enroll** in the first semester of thesis or applied project credit hours the student must have an approved applied project or thesis proposal in their BDS Canvas organization. To review and complete the Canvas proposal requirements, please go the [BDS, MS graduate advising website](#) to review the Applied Project/Thesis Proposal Approval process.

Graduation Requirements

Congratulations on nearing the completion of your master's degree. There are a few administrative items that need your attention:

1) Ensure you have an approved and up-to-date iPOS on file.
2) *Apply for graduation via My ASU

*Applying for graduation and registering to attend in-person graduation ceremonies are separate but related issues. Applying and paying your graduation fee ensures that your degree will be processed after coursework is complete and certification of your degree is issued. Registering for attendance at ceremonies ensures that seating will be made available for you and your guests for the event(s) you will attend. It also ensures tickets will be reserved for those events that require tickets.

Ceremonies

There are a variety of opportunities to celebrate this milestone. Two of the most popular ceremonies are Commencement (ASU ceremony) and Convocation (College ceremony).

Commencement: Commencement ceremonies are the official graduation events for the university. During the university's graduate Commencement, President Crow confers degrees on all ASU graduate students (master's and doctoral candidates).

- **Master's degree candidates** will be hooded at Graduate Commencement, but will **NOT** be called individually to cross the stage.
- **Doctoral candidates** will be hooded at Graduate Commencement, have their names called and cross the stage individually to receive congratulations.

Convocation: Convocation ceremonies celebrate graduating New College of Interdisciplinary Arts and Sciences students and their achievements. During Convocation, New College of Interdisciplinary Arts and Sciences **graduates are individually recognized** for their academic achievement, including crossing the stage while their name is read.

Register to Attend an Event

All ASU graduation ceremonies require reservations (RSVPs) from graduating students who wish to participate. Attendance is not mandatory or you may elect to attend one or more ceremonies.

Register to Attend Commencement

Register to Attend New College Convocation

Summer graduates completing coursework in August may opt to participate in ceremonies the May prior to course completion or the December following course completion.

Faculty

Dr. Nilesh Dixit is the Program Director for the West Valley campus and online MS in Biological Data Science programs.

The Arizona State University faculty is at the forefront nationally in advancing research and discovery. Our more than 4,700 faculty members inspire new ways of thinking, innovating and solving problems socially, culturally and economically in our region and in the international community.

We aspire to create an accessible academic experience and attract faculty not bound by traditional disciplinary distinctions, but who embrace an inclusive, collaborative and entrepreneurial environment defined by excellence and impact.

The MNS faculty listed at the [BDS New College Graduate Advising website](#) have projects with opportunities for BDS students. If you are interested in working with faculty member who is not listed here, send them an email inquiry about conducting research with them. You may also ask the BDS director to help with an introduction.

Degree Progress

Registration and Course Selection

Students will register for classes each semester via My ASU and use their course sequence or approved iPOS as a guide for registration. The schedule of classes is available [here](#).

The recommended course sequence varies slightly for each admit term and can be viewed online at the MS Biological Data Science West Valley campus [advising website](#). It is important to consider your personal and professional commitments when you select a completion timeline. Summer registration is required for students based on the course sequence.

Continuous Enrollment Policy

To remain active at ASU, graduate students must be continuously registered for a minimum of 1 graduate credit hour in every fall and spring semester.

Students who fail to enroll in any semester (not including summer) will be dropped automatically by the ASU Graduate College and have to re-apply and be re-admitted to continue working towards the degree.

Please review the Registration and Course Selection above.

Drop/Add Withdrawal

The [ASU Academic Calendar](#) lists specific dates and deadlines for each semester. Exceptions to published dates are rare and made on a case-by-case basis.

Request Leave of Absence

Students can apply for a formal waiver of the continuous enrollment requirement or a leave of absence (up to 2 semesters). These must be submitted via the iPOS in My ASU and approved by the student success team, program director, and the Graduate College prior to the semester for which the waiver or leave of absence is requested.

Interactive Plan of Study (iPOS)

What is the interactive Plan of Study (iPOS)?

The interactive Plan of Study (iPOS) functions as an agreement between the student, the academic unit, and the ASU Graduate College. It will support you as you make progress toward your degree requirements. ([Learn More](#))

The iPOS allows you to plan for your course load, can guide registration each term, and provides an anticipated timeline for degree completion.

How do I select courses for my iPOS?

In a graduate program, the specific courses that will count toward a student's degree must be approved by the student's faculty advisor, also known as the **supervisory committee chair**, and the BDS Program Director. The list of these courses is called an interactive Plan of Study (iPOS). This is filed online through the Interactive Plan of Study (iPOS) available through the student's My ASU portal. The iPOS must be **complete and approved by the end of your first year** of the program. This means that students should have conversations with their supervisory committee chair about what courses the student will take during the second year. The iPOS can always change if student's plans change or a new course appears that the student would rather take.

For assistance with filing the iPOS, the student should contact the supervisory committee chair, the graduate staff advisor at ncgradadvising@asu.edu, and/or [download the iPOS instruction manual](#). After the initial iPOS is submitted, the supervisory committee chair and program director will approve it. You can track the approval process online through your My ASU account.

When the BDS director and supervisory committee chair evaluate an iPOS, the program requirements described above will be confirmed. In addition, the following rules below will be verified:

- No more than 6 credits received from non-SMNS faculty may count toward the degree (including transfer credits). Note that requests to take outside courses are evaluated on a case-by-case basis according to student/faculty research

interests. Just because one student is allowed to take a course does not mean that all students may take it.

- You must maintain a 3.0 GPA to progress in the program and graduate
- You must be enrolled in at least one credit during the semester in which you defend your thesis or complete your project.

All courses that appear on the iPOS are applied toward the student's MS degree and are ineligible to be applied toward a future graduate degree. As such, it is recommended that a student list only the 32 credits required for the MS degree on the iPOS.

How to create an iPOS

To access the iPOS: Login to My ASU. From the My Programs box, under the Programs tab, select iPOS. Select Graduate Interactive Plan of Study (iPOS). Note: Pop up blockers may need to be turned off.

You will find instructions for submitting the iPOS in the downloadable how-to guide.

All of the information you need to submit your iPOS including course requirements by semester, faculty advisor, and anticipated graduation term are available on the course sequence at the BDS, MS West Valley campus advising website.

Academic Progress

Satisfactory Academic Progress

This policy applies to all graduate students in the New College of Interdisciplinary Arts & Sciences. All graduate students are expected to make systematic progress toward the completion of their degree. In order to remain in good standing in the New College of Interdisciplinary Arts & Sciences (NCIAS), students must maintain satisfactory academic progress. This document sets forth the standards for "satisfactory academic progress" and "good standing" and explains the consequences of not meeting these standards.

Review the complete policy and performance requirements here.

In addition to requirements outlined in New College Satisfactory Academic Progress Policies students must achieve a grade of "C" or higher in all *required courses* that appear on the approved Plan of Study (required courses are listed in the ASU Academic Catalog). A student who receives a "D" or lower in a core course in their program must repeat the course in a regularly scheduled (not an individualized instruction) class. Although the "C" or higher can be included on the iPOS GPA, both grades will be used to compute the Cumulative GPA and the Overall Graduate GPA.

Required Core Courses: ACO 501, LSC 555, LSC 556, LSC 562

Other Requirements for Campus Immersion Students: LSC 547, LSC 540, LSC 541, LSC 519

Culminating Experience:
     599 *Requires a final Y grade
     593 *Requires a "B" or higher grade

Maximum Time Limit

All work toward a Master's degree must be completed within six consecutive years.

Academic (grade) Grievance Policy

The New College of Interdisciplinary Arts & Sciences requires that any student seeking to appeal a grade must follow the Academic (grade) Grievance Policy.

Review the complete policy and steps located in the "Graduate policies" section of the New College Academic Catalog policies located here.

Student Code of Conduct and Academic Integrity

Student Code of Conduct

All students are expected to adhere to the Arizona Board of Regents Student Code of Conduct.

Academic Integrity

New College and the MS Biological Data Science program have a zero-tolerance policy toward academic dishonesty that is enforced within every course and educational activity offered or sanctioned by the school. Any allegation of academic dishonesty will be referred to the school's Office of Student Rights and Responsibilities for review and recommendation to the Dean of the school. If any student is found to have engaged in academic dishonesty in any form – including but not limited to cheating, plagiarizing and fabricating data – that student shall receive a grade of XE for the class and will be dismissed from the school. There are no exceptions. Please refer to the University's Academic Integrity Policy for the full policy.

International students who violate academic integrity policies may be dismissed immediately. Being withdrawn from a degree program can have immediate consequences regarding visa status, and dismissed students are required to leave the country immediately per immigration and visa rules.

At the beginning of every MS Biological Data Science class, each student will be given a copy of the full academic integrity policy, along with accompanying information on plagiarism in their course syllabus. More detailed guidance on how to avoid plagiarism and fabrication, can be found at: https://ori.hhs.gov/avoiding-plagiarism-self-plagiarism-and-other-questionable-writing-practices-guide-ethical-writing

Professional Ethics

In addition to academic integrity commitments, students in the Biological Data Science MS program must abide by the highest levels of ethics. This includes following the core principles of the APA Code of Ethics, including conducting research ethically and independently, privacy and confidentiality, and record keeping.

Resources

There are a number of resources available in the program and through the university.

Funding for Travel

As research is a core component of this program, we encourage our students to conduct and present research at national and international academic conferences. As such a number of options exist for funding research (e.g., participant payment, supplies, equipment) and conference travel expenses.

MS Biological Data Science Program Funding. The MS program makes approximately $1000 in travel/research funding available, to be used over the course of the two-year program. Students may choose to use that money in one year or split it over the two years in the program. Contact Program Director with questions. Additional funds may be requested and will be reviewed on a case-by-case basis as budget allows. Travel funding can only be approved for current students and cannot be completed after graduation. Also, you may be able to apply any unused funds toward travel expenses for doctoral program interviews. However, please note, that the Biological Data Science faculty expect students to utilize the allotted funds for conference travel and research (as it is unlikely that students will be interviewed by doctoral programs if they have not conducted and presented their research). As with the other funding requests, your advisor and BDS Director must approve, and you must explain why you have remaining funds for this type of request.

> ***Funding Priorities for Biological Data Science Program Fee Monies***
> *(not rank ordered)*
> - Presenter at a professional conference
> - Co-authorship on a conference presentation
> - Thesis/Applied Project research expenses such as publication fees for published manuscript authored by student.

- Doctoral program interview expenses (only if monies remaining after prior travel/research expense requests)
- Professional conference attendance only – not presenting (<u>no funding</u>)

ASU Graduate College Travel Grants. ASU's Graduate College makes a limited number of travel grants available to students presenting at conferences. These grants typically cover airfare from Phoenix to the conference location and conference registration. This award has four application deadlines per year and must be applied for well in advance of the travel date. Applications must be submitted to the director of the graduate program. See https://graduate.asu.edu/current-students/funding-opportunities/awards-and-fellowships/travel-awards for more information and deadlines.

Graduate and Professional Student Association (GPSA) Travel Grants. ASU's graduate student association offers a variety of travel awards available. Individual travel awards (to conferences) are up to $950 and have a monthly application deadline. Group travel grants are for teams of student researchers presenting a symposium or other group project. Interview travel grants are need-based grants made available to students who require funds in order to travel to an academic interview (e.g., at a PhD program). Details and application materials can be found at http://gpsa.asu.edu/funding. Priority for funding is often given to those who volunteer for the GPSA. <u>Please note</u>: The deadlines for these are often several months prior to the conference or PhD interview (i.e.., in October) – you can still apply even if you do not know about your acceptance to a conference or invitation to interview.

External Student Travel Funding from professional societies. Some professional societies have free or discounted student memberships, and travel grants to present research at their conferences. Such societies and travel links are the Society for Industrial and Applied Mathematics: https://www.siam.org/Conferences/Travel-Support/SIAM-Student-Travel-Awards , the American Statistical Association https://www.amstat.org/your-career/awards/student-and-early-career-travel-fund and the Society for Mathematical Biology: https://www.smb.org/travel-grants/. Please consult your advisor to see if other professional societies might be more appropriate for your particular research area.

Academic and Professional Services

- ASU Library now has an online tutorial version of "Library 501: What Grad Students Need to Know about the Library" workshop available for online and ground students and anyone else for whom it might be useful. The Library 501 tutorial can be found on the tutorials page under "Other Tutorials".
- Career & Professional Development Services – resource for finding jobs and internships, career advising, and more; online services available.
- Graduate Academic Support Services – in-person (all campuses) and online, no-cost writing and statistics tutoring (most services are free except for special sessions, refer to the website for more details).

New College/West Valley Campus - Amenities

- [Dining Options](#)
- [Banks](#)
- [Parking & Transit](#)
- [Campus Shuttles](#)

Student Support Services

- [Counseling](#)
  - [Graduate Student Wellness Resources](#)
  - [Graduate Student Wellbeing](#)
- [Educational Outreach & Student Services (Dean of Students Office)](#)
- [Graduate Student Diversity Resources](#)
- [Health](#)
- [Housing](#)
- [ID Cards](#)
- [International Student Services Center (ISSC)](#)
- [Sexual Violence Awareness, Prevention and Response](#) (Title IX)
- [Student Accessibility and Inclusive Learning Services (SAILS)](#)
- [Student Rights and Responsibilities](#)
- [Veterans](#)

University Contact Information

- [Emergency Services](#)
- [Graduate College](#)
- [GPSA Outreach](#)
- [Provost's Office](#)
- [Student Business Services](#)
- Title IX Information and Coordinator
  - ASU prohibits all forms of discrimination, harassment and retaliation. To view ASU's policy please see https://www.asu.edu/aad/manuals/acd/acd401.html.
  - Title IX protects individuals from discrimination based on sex in any educational program or activity operated by recipients of federal financial assistance. As required by Title IX, ASU does not discriminate on the basis of sex in the education programs or activities that we operate, including in admission and employment. Inquiries concerning the application of Title IX may be referred to the Title IX Coordinator or to the U.S. Department of Education, Assistant Secretary, or both. Contact titleixcoordinator@asu.edu or 480-965-0696 for more information. Office located at 1120 S. Cady Mall, INTDSB 284. For information on making a report please go to www.asu.edu/reportit/.
- [University Technology Office/IT Help](#)

Program Contact Information

With specific questions about the Graduate Program in Biological Data Science, MS, contact:

       Dr. Jennifer Broatch, Program Director
       New College of Interdisciplinary Arts & Sciences
       Jennifer.broatch@asu.edu

or

       Graduate Studies Advising Team
       New College of Interdisciplinary Arts & Sciences
       (602) 543-3000
       NCGradAdvising@asu.edu

With general questions about ASU Graduate Studies policies/procedures, contact:

       Graduate College
       Interdisciplinary Building, B Wing, Suite 285 – Tempe campus
       http://graduate.asu.edu/

With questions about tuition, scholarships, and financial aid:

       ASU Financial Aid
       University Center Building, Suite 101
       http://students.asu.edu/financial-aid

ASU New College
of Interdisciplinary Arts and Sciences
Arizona State University