

Applied Mathematics for the Life and Social Sciences, PhD

LAAMLPHD

Unlock the broader methods and scope of applications for mathematics. You could help meet the high demand for first-rate scientists, researchers and faculty who are equipped with advanced computational mathematics and modeling approaches and are interested in understanding and meeting the evolving human-based challenges faced by communities everywhere.

Program description

Degree awarded: PHD Applied Mathematics for the Life & Social Sciences

The PhD program in applied mathematics for the life and social sciences focuses on the training needed for analyzing and more definitively answering questions about underlying patterns hidden within human health, behaviors and experiences, and for teaching others to do the same.

Under the transdisciplinary instruction of national experts from five different schools at Arizona State University, program participants learn new applications for tools such as agent-based models, evolutionary computing, geographical information systems, machine learning, multiobjective optimization, nonlinear dynamical systems and stochastic processes. In doing so, they unlock new revelations and categories for not just understanding the material, but also the need for scientists and professionals quantitatively trained in the life and social sciences.

At a glance

- **College/School:** [College of Global Futures](#)
- **Location:** [Tempe](#)

Degree requirements

84 credit hours, a written comprehensive exam, an oral comprehensive exam, a prospectus and a dissertation

Required Core (6 credit hours)

AML 610 Topics in Applied Mathematics for the Life and Social Sciences (3)

AML 612 Applied Mathematics for the Life and Social Sciences Modeling Seminar (3)

Other Requirements (15 credit hours)

ASM, AML or BIO: courses in evolution, ecology or social sciences (400 level or above) (3)*

one graduate-level course in biostatistics (3)*

one graduate-level School of Mathematical and Statistical Sciences course approved by graduate chair (3)

APM, AML, MAT 590 or 790 Reading and Conference (6)

*Substitution courses may be acceptable with approval of director.

Electives (39 credit hours)

Research (12 credit hours)

AML 592 or 792 Research (12)

Culminating Experience (12 credit hours)

AML 799 Dissertation (12)

Additional Curriculum Information

Electives must include six credit hours of life science and six credit hours of social sciences.

Once the 15 credit hour requirement in the Other Requirements section has been fulfilled, other courses from that category may be taken as electives.

Students must register for research credit (AML 592 or 792) supported by their participation in one of two summer programs, Mathematical and Theoretical Biology Institute or J. Bustoz Math-Science Honors Program, sponsored by the Simon A. Levin Mathematical, Computational and Modeling Sciences Center. Up to three credit hours of research per summer may be applied based on hours and level of participation with approval from the graduate chair and the summer program director.

When approved by the student's supervisory committee and the Graduate College, this program allows 30 credit hours from a previously awarded master's degree to be used for this degree. If students do not have a previously awarded master's degree, the 30 hours of coursework will be made up of electives to reach the required 84 credit hours.

All students must maintain an average GPA of 3.20 (scale is 4.00 = "A") in their courses and complete degree requirements per the program's satisfactory progress policy.

Admission requirements

Applicants must fulfill the requirements of both the Graduate College and the College of Global Futures.

Applicants are eligible to apply to the program if they have earned a bachelor's or master's degree from a regionally accredited institution. A master's degree in the social sciences (e.g., anthropology, gender studies, geography, sociology), life sciences or related fields (e.g., biology, ecology, genomics), applied mathematics, mathematics or statistics is preferred.

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. personal statement outlining educational and professional goals
4. current curriculum vitae or resume
5. three letters of recommendation
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.

Applicants may submit an optional scholarly writing sample, not to exceed 30 double-spaced pages, to be included in their application materials.

Prior to admission, students should have completed, at the undergraduate junior or senior level, a minimum of the following:

- 15 credit hours of mathematics or statistics
- nine credit hours of life sciences and social sciences coursework at the senior or college graduate level
- no fewer than three credit hours each of life sciences and social sciences coursework

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.

Application deadlines

Fall

[expand](#)

Global opportunities

Global experience

Studying abroad is encouraged for graduate students. Nearly all of the College of Global Futures faculty-directed programs offer graduate credit. In addition, the Global Education Office offers more than 50 program opportunities, with programs on every continent.

Faculty-directed programs tend to be the best fit for graduate students; taking courses with ASU professors over the summer or during academic breaks offers students close mentorship and professional network growth in many fields of study while they earn ASU credit. Exchange program participation is also possible with careful planning.

Students can find programs specific to their interests on the [College of Global Futures Study Abroad](#) webpage, and additional opportunities and information on the [ASU Global Education Office](#) website. These sites also include additional information about applying for funding to support global travel.

Graduate students are also encouraged to apply for funding for international research, study and professional development through [ASU's Lorraine W. Frank Office of National Scholarships Advisement](#).

Career opportunities

The need for scientists and professionals quantitatively trained in the life and social sciences is strong in Arizona and the nation. This degree's applied use of mathematics, modeling, statistics and simulation methodologies are in high demand and provide excellent training for future academics and professionals.

Graduates are prepared to enter the environmental, life, health, mathematical and social science fields. They possess the quantitative, scientific and analytical skills that are critical for professionals working in these areas.

This program creates entirely new opportunities, while building upon mathematical foundations and in-demand career paths long established in fields such as:

- bioinformatics
- computational sciences
- data mining
- ecology
- genomics
- mathematical analysis
- mathematical epidemiology
- nonlinear dynamics
- population dynamics
- social science

Contact information

