Learn to solve real-world problems in this innovative program that combines anthropology with statistical modeling and applied mathematics. From gene mapping in the pursuit of custom-tailored medicines to ecological forecasting models that warn of impending natural phenomenon, our acclaimed faculty will prepare you for an exciting cross-disciplinary career.

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 training researchers to analyze scientific questions at the intersection of the mathematical, life and social sciences. Graduates of the program make innovative and far-reaching scientific contributions that rely on cutting-edge computational mathematical and modeling approaches.

This program focuses on producing quantitative scientists and applied mathematicians conducting high-level, transdisciplinary research. The faculty include mathematicians, statisticians, theoretical biologists and social scientists from five different schools at Arizona State University.

There is a high demand for first-rate scientists, researchers and faculty interested in meeting the challenges faced by communities in the 21st century. Institutional research and planning programs create space and opportunity to address such challenges on a global scale. The health, environmental and natural resource challenges in Arizona and the nation are urgently in need of a large pool of researchers with these transdisciplinary skills.

There are three tracks a student can follow. Applied mathematics is a more in-depth focus on the tools applied to the life and social sciences, such as dynamical systems, computational and numerical methods, simulation and mathematical analysis. Life sciences focuses on understanding the tools for representing the structure and operation of complex biological and ecological processes. Social sciences focuses on understanding the tools for representing the structure and operation of complex social systems and processes.
By offering courses that enhance transdisciplinary exchanges and collaboration among faculty and students interested in addressing questions of social relevance, the program builds upon foundations already established in:

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

At a Glance

- **College/School:** The College of Liberal Arts and Sciences
- **Location:** Tempe campus

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)**
See the Additional Curriculum Information section below.
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.

Courses (beyond the 15 credit hour requirement) from the Other Requirements section may be used 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 a 3.20 (scale is 4.00 = "A") average GPA 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 Liberal Arts and Sciences.

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 of a 3.00 cumulative GPA (scale is 4.00 = "A") in the last 60 hours of their first bachelor's degree program, or applicants must have a minimum of a 3.00 cumulative GPA (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. GRE scores
6. three letters of recommendation
7. proof of English proficiency

**Additional Application Information**

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

Applicants may submit an optional scholarly writing sample of 20 to 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:

1. 15 credit hours of mathematics or statistics
2. nine credit hours of life sciences and social sciences coursework at the senior or college graduate level
3. no fewer than three credit hours each of life sciences and social sciences coursework

**Application Deadlines**

**Fall**

**Contact Information**

School of Human Evolution & Social Change | SHESC 233
shesc.grad@asu.edu | 480-965-6215

Admission Deadlines