

Exploration Systems Design (Systems Engineering), PhD

LAESDSEPHD

Prepare for a professional or academic career through a program that combines the creative strengths of science and engineering. You can study artificial intelligence, human factors engineering, smart materials and structures, and robot modeling with faculty specializing in the natural sciences, instrumentation design and systems engineering.

Program description

Degree awarded: PHD Exploration Systems Design (Systems Engineering)

The PhD in exploration systems design program offers an advanced systems approach for developing scientific exploration technologies in a range of demanding environments on Earth and in space.

This transdisciplinary degree program provides a valuable platform for training systems engineers who are interested in developing technologies for exploration science. This collaborative program between the School of Earth and Space Exploration and the Ira A. Fulton Schools of Engineering allows students to specialize in topics related to planetary exploration, astronomical instrumentation, robotics, sensors and sensor networks.

The curriculum integrates the School of Earth and Space Exploration's science, instrumentation and systems engineering core courses with related coursework from the Ira A. Fulton Schools of Engineering. The systems engineering concentration prepares students in the design, planning, creation and operation of complex exploration systems, including spaceflight and missions and large, multidisciplinary experiments.

At a glance

- **College/School:** [The College of Liberal Arts and Sciences](#)

- **Location:** [Tempe](#)

Degree requirements

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

Required Core (1 credit hour)

SES 502 Exploring SESE Research (1)

Electives or Research (61 credit hours)

Other Requirements (1 credit hour)

SES 501 SESE Colloquium (1)

Concentration (9 credit hours)

Culminating Experience (12 credit hours)

SES 799 Dissertation (12)

Additional Curriculum Information

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 in a related field to be used for this degree. Related fields include engineering, computer science, geological sciences or physics.

As part of the electives or research, students take two science courses selected from the SESE graduate course catalog (GLG, SES or AST prefixes). Substitutions may be made per academic unit approval.

Substitutions for Other Requirements courses may be made per department approval.

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 in any field 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 applicants must have 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 admissions application and application fee
2. official transcripts
3. statement of purpose
4. three letters of recommendation
5. 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.

Systems engineering concentration: Successful completion of a senior capstone or design project is an admission requirement for this concentration. Students who have not had a design course are required to take SES 405 Exploration Systems Engineering as a deficiency course.

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

Spring

[expand](#)

[expand](#)

Career opportunities

Professionals with expertise in exploration systems design are in high demand across sectors and industries, including remote sensing, systems engineering, data science, consulting, Earth and planetary science, and engineering. Coding and numerical modeling skills translate across many domains, even beyond exploration systems design. Skills in the design, manufacture and deployment of engineered solutions to science problems are valuable to businesses and institutions relying on data-driven strategies to manage large teams and complex problems.

The doctoral degree in exploration systems design is generally required for careers in post-secondary education and research.

Career examples include:

- data scientist
- engineering professor
- instrument builder
- project manager
- research engineer
- systems engineer

Contact information

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