

Exploration Systems Design (Instrumentation), PhD

LAESDIPHD

Prepare for a professional or academic career by combining the strengths of science and engineering. You'll work with faculty in the natural sciences and engineering to design instrumentation for exploration, including digital systems and circuits, computer-controlled systems, analog-to-digital converters and solid-state electronics.

Program description

Degree awarded: PHD Exploration Systems Design (Instrumentation)

The PhD program in exploration systems design 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 distinct platform to train systems engineers targeting technological development for exploration science. This collaborative program between the School of Earth and Space Exploration and the Ira A. Fulton Schools of Engineering enables 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 instrumentation concentration prepares students in the development of state-of-the-art sensors and systems for remote and in situ sensing related to planetary science, Earth science and astronomy.

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)

Concentration (9 credit hours)

Other Requirements (1 credit hour)

SES 501 SESE Colloquium (1)

Electives or Research (61 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, but are not limited to, engineering, computer science, geological sciences and physics.

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

Substitutions for Other Requirements 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. An undergraduate degree in electrical engineering, aerospace engineering or mechanical engineering 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 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.

Students should see the program website for application deadlines.

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, technical 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 that rely on data-driven strategies to manage large teams and complex problems. The doctoral degree in exploration systems design is generally required for careers in postsecondary education and research.

Career examples include:

- data scientist
- engineering professor
- instrument builder
- machining specialist
- project manager
- research engineer

Contact information

