Exploration Systems Design (Sensor Networks), PhD

Combine your interests in exploration systems design and sensor networks with the strengths of science and engineering to prepare for professional and academic careers. Study computer networks, Earth-systems engineering, multidimensional signal processing, and information and random signal theory with faculty who specialize in the natural sciences and instrumentation design.

Program Description

Degree Awarded: PHD Exploration Systems Design (Sensor Networks)
The exploration systems design PhD 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 unique 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 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 sensor networks concentration prepares students in the development of networked software and hardware systems related to earth and space exploration, including robotics, data science and high-performance computing.

At a Glance
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, but are not limited to, engineering, computer science, geological sciences or 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.

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 current residency.

Students should see the program website for application deadlines.

An undergraduate degree in electrical engineering or computer science is preferred.

Application Deadlines

Fall

Spring

Career Opportunities

Professionals with expertise in exploration systems design are in high demand across sectors and industries, including remote sensing, systems engineering, data science, environmental 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
- sensor technologist

Contact Information

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