

Human Systems Engineering, PhD

TSSMACSPHD

Program description

Degree awarded: PHD Human Systems Engineering

Human systems engineering describes a growing transdisciplinary field consisting of the disciplines of psychological sciences and engineering. This field explores how people interact with technological and social systems in contexts that include transportation, medicine, military, computing and other complex systems.

The program broadly pulls from the areas of human factors and cognitive science. Human factors provides training in the foundation for the application of psychological and physiological principles to the engineering and design of products, processes and systems. Cognitive science provides the foundation necessary for integrating human capabilities and limitations into complex sociotechnical systems (i.e., the practice of cognitive engineering), and the application of cognitive science relies heavily on human systems engineering techniques.

A large domain exists in which the combination of human factors and applied cognitive science with a systems approach is imperative for the design of complex sociotechnical systems. Examples include:

- the design and evaluation of learning settings and technology (learning engineering)
- development of intelligent agents that work well with humans
- driving simulators for research on driver distraction
- dynamical systems models of team interaction
- gaming simulators for studying business decision-making
- human-in-the-loop simulation studies of cybersecurity analysis
- medical simulations for health care research
- models of cognitive states and processes of sociocultural systems
- nuclear control room simulations for improved human system integration
- pilot training research using aircraft simulators
- simulations of consumer behavior
- tests of future airspace control concepts using air traffic control simulators

This PhD program in human systems engineering is designed to ensure graduates are well-grounded and skilled in the methods of human systems engineering. The curriculum provides transdisciplinary, research-driven training in the computing, engineering, technology, applied cognitive science and human systems integration.

At a glance

- **College/School:** [Ira A. Fulton Schools of Engineering](#)
- **Location:** [Polytechnic](#)

Degree requirements

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

Required Core (12 credit hours)

HSE 520 Methods and Tools in Applied Cognitive Science (3)

HSE 521 Methods and Tools in Human Systems Engineering (3)

HSE 540 Foundations of Applied Cognitive Science (3)

HSE 542 Foundations of Human Systems Engineering (3)

Foundations (6 credit hours)

Methods and Tools (3 credit hours)

Applications (9 credit hours)

Electives (36 credit hours)

Research (6 credit hours)

HSE 792 Research (6) or additional electives as selected by the PhD committee

Culminating Experience (12 credit hours)

HSE 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 to be used for this degree. If students do not have a previously awarded master's degree, the 30 hours of coursework are made up of electives.

Electives are identified by the committee and approved by executive committee's approval.

No more than six credit hours of 400-level course work can be included on a graduate plan of study.

Students may petition the HSE Executive Committee to allow HSE-relevant or dissertation-relevant courses to be included as HSE elective courses.

Admission requirements

Applicants must fulfill the requirements of both the Graduate College and the Ira A. Fulton Schools of Engineering.

Applicants are eligible to apply to the program if they have earned a minimum of a bachelor's degree in psychology, engineering, cognitive science, computer science or a closely related field from a regionally accredited institution.

Applicants must have a minimum cumulative GPA of 3.00 (scale is 4.00 = "A") in their first bachelor's degree program or 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 nine semester hours of graduate coursework from a U.S. institution; or a minimum cumulative GPA of 3.00 (scale is 4.00 = "A") in an applicable conferred master's degree program from a regionally-accredited college or university.

All applicants must submit:

1. graduate admission application and application fee
2. official transcripts from each college or university attended
3. personal statement
4. professional 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 should review the [Graduate Admission Services](#) website. Global Launch at ASU offers an online alternative to standardized testing for international students who are seeking admission to ASU but need proof of English proficiency.

If the applicant does not meet the minimum GPA requirements, the application may still be considered. In certain cases, demonstrated aptitude through professional experience or additional postbaccalaureate education is considered.

Unofficial transcripts may be submitted at time of application. If admitted, applicants must then submit official transcripts to ASU Graduate Admission Services.

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](#)

Program learning outcomes

Program learning outcomes identify what a student will learn or be able to do upon completion of their program. This program has the following program outcomes:

- Graduates with a PhD in human systems engineering will synthesizing research in human systems engineering into a literature review.
- Graduates with a PhD in human systems engineering will be able to answer research questions using the methods and tools of human systems engineering area.
- Graduates with a PhD in human systems engineering will be able to independently design an approach for addressing the questions, collecting, analyzing and interpreting data in the area of human systems engineering.

Career opportunities

Graduates are well-grounded in cognitive science and skilled in its methods and applications. Employers (e.g., Department of Defense, Federal Aviation Administration, Nuclear Regulatory Commission, hospitals) have an ever-increasing demand for personnel who can bridge the gap between rigorous science and solutions to contemporary problems. This program prepares students for industry, academic and government careers in positions such as:

- human factors engineer
- human systems integrator
- information systems designer
- interface designer
- military scientist
- usability engineer
- user experience designer

Graduates may work as a member of a design team for a product or system.

Contact information

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[Admission deadlines](#)

