Human Systems Engineering, PhD

Program Description

Degree Awarded: PHD Human Systems Engineering

Human systems engineering describes a growing transdisciplinary field (including the disciplines of psychology, engineering and computer science) that explores how people interact with technological and social systems in contexts that include transportation, medicine, military, computing and other complex 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 methods.

A large domain exists in which the coupling of applied cognitive science with human factors is imperative. Examples include the following:

- development of intelligent agents
- 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 simulation for health care research
- models of cognitive states and processes or sociocultural systems
- nuclear control room simulation for improved human system integration
- pilot training research using aircraft simulators
- simulation of consumer behavior
- tests of future airspace control concepts using air traffic control simulators

This PhD program is designed to produce individuals who are well-grounded and skilled in the methods of human systems engineering. Employers (e.g., Department of Defense, Federal Aviation Administration, Nuclear Regulatory Commission, hospitals, etc.) have an ever-increasing demand for personnel who can bridge the gap between rigorous science and solutions to real-world problems. The doctoral program 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 campus

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 (6-30 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 will be made up of electives.

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

No more than six credit hours of 400-level coursework 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 closely related field from a regionally accredited institution.

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 from each college or university attended
3. official GRE general exam scores
4. statement of research interests
5. writing sample
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. Complete information on the English proficiency exams and other required documents is available at [https://admission.asu.edu/international/graduate/english-proficiency](https://admission.asu.edu/international/graduate/english-proficiency).

Applicants should see the program website for application deadlines. Late applications may still be considered for the same application term; however, the department reserves the right to deny or not review a late application.

Admission to the graduate degree program presupposes an adequate technical preparation in statistics, cognitive science and experimental methods. Applicants who lack some of the required preparation still may be admitted but assigned deficiency courses which must be completed within the first semester of starting the graduate program while concurrently enrolled in graduate-level coursework. Deficiency courses are assigned after admission is granted but before the start of the student's first semester. A faculty member will notify students with deficiencies and the specific course requirements via email.
Application Deadlines

Fall

Contact Information

Human Systems Engineering | WANER 101
polygrad@asu.edu | 480-727-4723
Admission Deadlines