



ASU® Ira A. Fulton Schools of
Engineering
Arizona State University

Human Systems Engineering, Ph.D.
Graduate Student Handbook

The Polytechnic School

<https://poly.engineering.asu.edu/hse/>

Human Systems Engineering, PhD

2020-2021

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PhD Human Systems Engineering

Program Overview

Human Systems Engineering describes a growing transdisciplinary field (including the disciplines of psychology and engineering) 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 or human systems engineering).

Examples of possible research topics include:

- Development of intelligent agents
- Driver distraction
- Dynamical systems models of team interaction
- Business decision-making
- Cyber security analysis
- Cognitive modeling
- Modeling sociocultural systems
- Health care human factors
- Nuclear control room human system integration
- Pilot training research
- Tests of future airspace control concepts

This Ph.D. is designed to produce individuals who 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, industry) have an ever-increasing demand for personnel who can bridge the gap between rigorous science and solutions to real-world problems. The Ph.D. degree will provide transdisciplinary, research-driven training in applied cognitive science and human systems engineering.

The program is in the Polytechnic School, one of the six Fulton Schools of Engineering. The program webpage can be found at: <https://poly.engineering.asu.edu/hse/phd/>.

Admissions

Admission to the PhD in Human Systems Engineering program requires the completion of all general admission requirements and procedures set forth by Graduate Admission Services. For general information on applications, deadlines, international requirements, application requirements, and other information, please see **Graduate Admission Services**. Prior to submitting an application to Graduate Admission Services, applicants should review the information provided in this handbook regarding the degree program, including specific application requirements and deadlines.

Submission of an Application

For admission information and procedures, review the **How and When to Apply For Graduate Admission** website. Applications for all graduate degree programs and non-degree status must be submitted via the **application website**.

Current students with an approved *Request to Maintain Continuous Enrollment* petition on file with the Graduate College prior to their semester of nonregistration and are continuing the same degree program for the semester immediately following the approved request are not required to submit a new application for admission.

Application Deadlines

Complete applications must be received by the application deadline for full consideration.

Fall semester (August) December 31 of the preceding calendar year

Admission and Eligibility

Admission to the PhD in Human Systems Engineering program requires completion of a bachelor's degree in engineering, psychology, cognitive science, computer science or a closely related field from a regionally accredited institution or the equivalent of a U.S. bachelor's degree from an international institution that is officially recognized by that country.

Applicants must meet the following admission requirements:

- A bachelor's degree in engineering, psychology, cognitive science, computer science or a closely related field.
- Admission to the graduate degree program presupposes an adequate technical preparation in statistics and cognitive science.
- Minimum of a 3.00 cumulative GPA (scale is 4.0=A) in the last 60 hours of a student's first bachelor's degree program.
- Minimum of 3.00 cumulative GPA (scale is 4.00=A) in graduate work, if applicable
- Transcript from undergraduate and graduate programs.
- Official GRE general exam scores
- Three (3) letters of recommendation
- Submit a current resume or CV and statement of research interests as part of the online admissions application
- International applicants must also meet the **English proficiency requirements**, as defined by Graduate Admission Services. Please be sure to review the [TOEFL, IELTS, or PTE score requirements](#), as your application will not be processed without valid proof of English proficiency.
- Applications are accepted for the fall semester only. Application deadline for fall semester is December 31 of the preceding calendar year.

A complete PhD Human Systems Engineering application for admission includes the following items:

- An online **Graduate Admission** application, including attachments of the following documents:
 - Resume or CV

- 300-500 word Statement of Research Interests (more details in online application)
- Writing Sample (more details in online application)
- Transcripts from each college and/or university attended
 - Unofficial transcripts can be uploaded directly to the online application. Official transcripts will be required if admitted.
 - Applicants are responsible for submitting official transcripts to Graduate Admission Services for their undergraduate degree and graduate coursework, if applicable.
- Official GRE general exam scores
- International applicants must also meet the **English proficiency requirements**, as defined by Graduate Admission Services. Please be sure to review the **TOEFL, IELTS, or PTE score requirements**, as International applications will not be processed without valid proof of English proficiency.

Academic units submit recommendations regarding admission decisions to Graduate Admission Services; only the Dean of Graduate Admission can make formal offers of admission. Applicants are able to monitor the status of their application through **My ASU**. If admitted, the formal letter of admission can be downloaded from My ASU. If denied admission, letters are sent via email to the address on record.

Financial Aid + Funding Opportunities

Several resources are available to help students understand how to finance a graduate degree. We recommend visiting **Pay for your Graduate Education** via Graduate College, and **Paying for College** via Financial Aid and Scholarship Services. For an estimated cost of enrollment, visit: **Standard Cost of Attendance**.

The **Funding Opportunities** page within the Polytechnic school site is intended to be a resource for doctoral students to learn more about funding and fellowship opportunities. Additionally, students may also review the **Fellowships and Funding** page for the Fulton Schools of Engineering.

Research Assistantships (RA) and Teaching Assistantships (TA) may be available but are not a guarantee with admission. If assistantships are available, the positions are managed within the program's department. Interested students should discuss their research interests with the HSE faculty members.

Program Requirements

The PhD in Human Systems Engineering requires a minimum of 84 credit hours. These credit hours must include the following:

54 credit hours are required beyond your 30 hours of master's credits. We anticipate that this program can be completed in three years. Please note that this list is not comprehensive and that with the EC's approval new courses can be added to this bank.

The EC's approval of a course does not, however, indicate that that particular course is ideal for a student's program of study. The advisor should work with the student to ensure a viable program of study tailored to that student's background and dissertation direction. The EC will be asked to weigh in when the IPOS is submitted for approvals.

These credit hours must include the following:

Foundations (12 credits)

HSE 540: Foundations of Applied Cognitive Science*
HSE 542: Foundations of Human Systems Engineering*
HSE 598: Applied Attention Theory
AMT 533: Aviation Systems and Psychology
CSE 571: Artificial Intelligence
EDP 540: Learning Theories and Instructional Strategies
FSE 598: Ethics in Tech Entrepreneurship: Autonomous Vehicles
IEE 547: Human Factors Engineering
PSY 528: Sensation and Perception
PSY 535: Cognitive Processes
PSY 550: Advanced Social Psychology
PSY 598: Choice and Decision Making

Tools and Methods (9 credits)

HSE 520: Methods and Tools in Applied Cognitive Science*
HSE 521: Methods and Tools in Human Systems Engineering*
HSE 531: Data Analytics
HSE 598: Statistics for Human Systems Research III
EDT 502: Design and Development of Instruction
GIT 540: Cross-Media Design Solutions
IEE 572: Design Engineering Experiments
OMT 570: Advanced Project Management
PSY 531: Multiple Regression in Psychological Research
PSY 534: Psychometric Methods
PSY 576: Dynamical Systems in Psychology
SER 574: Advanced Software Design

Applications (example courses - 9 credits)***

HSE 422: Human Factors in Sport**
HSE 423: Human Factors in Transportation**
HSE 424: Human Automation Interaction**
HSE 425: Human Factors in Medical Systems**
HSE 426: Training and Expertise**
HSE 427: Designing for Learning**
HSE 428: Judgment and Decision Making**
HSE 429: Product Design and Evaluation**
EDT 523: Issues in Online and Distance Education

PSY 560: Advances in Theoretical Psychology

TWC 544: User Experience

RESEARCH AND SCHOLARSHIP (18 credits)

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

HSE 799: Dissertation (12)*

** Required course for all PhD Human Systems Engineering students.*

***Note that according to the Graduate College no more than 6 credit hours of 400-level course work can be included on a graduate program of study.*

****In addition, students may petition the HSE Executive Committee to allow HSE-relevant or dissertation-relevant courses not listed here to be included as HSE elective courses.*

MS to PhD Milestones

	Milestone Activity	Time Frame
1	Identify and address course deficiencies.	Identify: time of admission; Address: by the end of your first semester
2	Find a permanent faculty advisor	In the first semester (ASAP)
3	Engage in research – Early and Often	Start in first semester and continue through the program
4	Take the four foundation courses and obtain a “B” grade or better in each	Complete these foundation courses in the first three semesters
5	Complete the first year project that serves as the Qualifying Exam	Due before the beginning of the second academic year
6	Complete other coursework	Ideally by the end of your second year
7	Establish a PhD Committee	When you have settled on a dissertation topic with your faculty advisor (in second year).
8	Submit your Interactive Plan of Study (iPOS)	When you have a committee and have registered for (NOT completed) 50% of their coursework (likely in the second year).
9	Complete a literature review that serves as the comprehensive exam	Take by the end of the second year and no later than the third year
10	Complete your Dissertation Project and Thesis	Around the end of your third year in the program

1. Identify and Address Course Deficiencies

At the time of admission, the HSE Executive Committee will work with you to identify any deficiencies in your previous coursework that may make particular core courses challenging.

Any identified deficiencies should be completed before enrolling in the related core course. You may make up deficiencies in the fall in parallel with the HSE core courses or you may choose to take an approved course equivalent at your undergraduate or master's institution during the summer. Please note that there may be tuition implications if you want to take a course at ASU the summer before you are officially enrolled. Contact the Graduate Advising Office if you want to take ASU classes before you are officially enrolled.

Cognitive Science

To succeed in HSE 540: Foundations of Applied Cognitive Science Core Course, you will need to have had some basic cognitive psychology, cognitive science, sensation and perception, or memory and cognition course. If you are missing a cognitive course you can enroll in HSE 323 or 324 which are offered on the Polytechnic campus or take an equivalent course at your home institution before you come to ASU. You may concurrently take these courses with HSE 540.

Research Methods

To succeed in HSE 520: Methods and Tools in Applied Cognitive Science, you need to have had an undergraduate course in research methods. This course should have covered such concepts as variables, validity, ethics, and experimental and correlational design. If you are missing this background, you should enroll in HSE 290, which is offered on the Polytechnic campus, PSY 290 which is offered on the Tempe campus, or take an equivalent course at your home institution before you come to ASU.

Statistics

To succeed in the program you also need to have had an advanced undergraduate course in statistics which has some coverage of Factorial ANOVA, repeated measures designs, and multiple regression. If you are missing this background, you should enroll in HSE 330, which is offered on the Polytechnic campus or take an equivalent course at your home institution before you come to ASU. You may take these courses concurrently with HSE 520.

2. Find a Faculty Advisor

You will be assigned a temporary advisor initially at the time of admissions. You should identify a permanent advisor as soon as possible. The advisor-advisee decision requires mutual agreement between the two parties; therefore, you are required to formally ask if the faculty member is willing to serve as your advisor. Those on the graduate faculty roster are currently eligible to advise and may chair your committee if designated as "Chair." However, other faculty not on the roster can apply to join the HSE graduate faculty.

We have set up a number of events early in the semester and throughout to facilitate this process. We encourage you to take advantage of these opportunities.

- 1) Look at faculty websites, setup individual meetings with faculty, etc.
- 2) Attempt to visit those faculty on the roster most aligned with your research interests in the first few weeks of class – even if for 10 minutes – to learn about their research

- 3) Attend the weekly brown bag seminars and other HSE lectures
- 4) Attend the beginning of the year celebrations to meet faculty (and other students) on a more informal basis

3. Engage in Research – Early and Often

The PhD is focused on research much more than classes. You should engage quickly and often in research projects. You are encouraged to collaborate with faculty other than your advisor and with other graduate students. The goal is to spread the word—so publish and present at meetings as much as possible.

4. Take the Four Required Courses and Obtain a “B” or Better in Each.

It is expected that students will complete the four HSE foundation courses in their first year and a half. Grades of “B” or better in these core courses are required for continuation in the degree program.

5. Complete the First Year Project that Serves as Your Qualifying Exam

Incoming HSE PHD students with a master’s degree will complete a first-year research project that will serve as the qualifying milestone. This project will be conducted under the guidance of an advisor and approved by a committee of 3 HSE faculty that includes the advisor. It could be a replication study, new empirical research in the advisor’s research area, or an independent research project proposed by the student and approved by the advisor. The objective is to engage PhD students in lab research early. Students are to be involved in all steps of the research project (i.e., hypothesis, experimental design, data collection, data analysis) which should culminate in a written conference proceedings paper (e.g., HFES or Cognitive Science Society) or journal article, with the expectation that it will be submitted for publication. The article will be submitted to the student’s review committee of three HSE faculty in time for a review and approval process by the start of the second year in the program. The three HSE faculty will provide feedback and decision (pass with minor revision, pass with major revisions, fail) within two weeks to the graduate program chair who will collate the feedback to present in written form to the student. The committee will take the following into account when making a pass/fail determination: adequate literature review, justification of research question(s) and hypotheses, detailed description of methods used in the study, correct reporting/interpretation of results, detailed discussion, academic integrity, and adherence to committee’s feedback. Note that close communication with your advisor and committee is strongly recommended. Completion of this task in a timely and satisfactory manner (as deemed by the HSE committee) will qualify the student to remain in the HSE PhD program.

6. Complete other coursework

See credit hour requirements above

7. Establish a PhD Committee

Each student’s committee is to have a minimum of three faculty members. One is your advisor. If your advisor is listed as a co-chair on the graduate faculty list, you also need to add a member of the graduate faculty who is eligible to chair. In this case, both your advisor

and the eligible chair will then co-chair your committee. At least one member of your committee should be a faculty member in the Human Systems Engineering program.

8. Submit your Interactive Plan of Study (iPOS)

Submit a Program of Study (iPOS) as soon as you have formed a PhD committee. Email the Executive Committee Chair whenever you submit changes to your iPOS (including petitions and committee approvals).

Contact the Graduate Advisor for assistance with submitting the iPOS online and getting it approved. Be sure to utilize the appropriate Plan of Study Outline included at the end of this handbook. *(See page 16 for POS Outline for student's with completed master's, see page 18 for POS Outline for student's enrolling in PhD from bachelor's program.)*

9. Complete a Literature Review that serves as your Comprehensive Exam

Once the student has passed the comprehensive exam, he or she is eligible to pursue the dissertation project proposed and is considered an official doctoral candidate. It is expected that the comprehensive exam will be completed by the end of the second year and no later than the third year.

For the PhD Comprehensive Exam, each student is required to write a literature review (approximately 20-40 pages in length) relevant to HSE and potentially, their dissertation topic. A literature review is not an annotated bibliography which summarizes articles that have been read, but is a coherent narrative that provides analysis, synthesis and a critical evaluation of the area. In doing so, the literature review should demonstrate best practices, organization, and insights as routinely found in published review articles. Students are strongly encouraged to examine published, well-cited review articles in relevant journals and use those sources as examples of good literature reviews. The literature review document would ideally be on the topic of the student's dissertation, and as part of the synthesis, would identify gaps and needs that form the basis for the dissertation work. Additionally, parts of this literature review document can be reused within the literature review of the dissertation proposal. This is expected to be a one-year process and should start in the summer following completion of the qualifying milestone. Failure to complete this task or completion in an unsatisfactory manner (determined by the HSE faculty) will result in removal from the program. Some examples of completion in an unsatisfactory manner could be failure to provide an adequate literature review or justification for research question(s), lack of detail on the description on methods used in the study, incorrect reporting of findings, lack of detail of within the discussion or synthesis, academic dishonestly (plagiarism), or lack of/insufficient adherence to committee's feedback. These are examples and should not be viewed as a complete list of unsatisfactory completion factors. Note the likelihood of project completion in an unsatisfactory manner can be lessened by communication with your committee before the defense of this assignment. The six-step Literature Review process is as follows:

- First, the student will determine an appropriate topic with their adviser.

- Second, the student will write up a brief prospectus and reading list with guidance from the adviser. The student will present the prospectus to the committee for approval and recommendations for additional articles.
- Third, the student will write the literature review with guidance from the advisor.
- The fourth step will be the *initial* review. Students will submit their literature review document to the full committee for review and comments. Committee members will provide a critique of the review on quality and completeness and provide a list of revisions and follow-up questions. The follow up questions can be specifically on the topic of the review, or on how other HSE concepts relate to the topic.
- In the fifth step, students will have two weeks to provide written responses to questions and critiques.
- Finally, a *final defense meeting* will be scheduled in which the student will give a presentation covering the review, responses to initial review feedback, and answer any follow-up questions by the committee. This meeting can result in the need for an additional modification of the literature review document.

Comprehensive Exam Results form is found in Appendix D of this handbook.

Culminating Experience Overview

10. Complete Your Dissertation Project and Thesis

The culminating experience for the PhD program will be the Dissertation. Students are expected to form a committee, write/defend a dissertation *proposal*, and write up and defend the *final* dissertation document after the work is complete.

The dissertation proposal is expected to contain an introduction section, method section, and analysis section along with all relevant supplemental information, typically as Appendices. The *Introduction* will include an opening subsection that sets the importance and specifies the rationale for the research question, a coherent literature review that systematically reviews the literature for the major components of the dissertation, and a final rationale subsection that lists the research questions, hypotheses and specific predictions (along with the reasoning behind why they were selected).

The *Method* section should include a description of the experimental designs, participants, all materials, and procedures for all proposed studies. If any development will be undertaken as part of the dissertation (e.g., modification/production of a new system or creation of new assessment), the proposed process should also be described within a "*Development*" subsection of the *Method* section.

The *Analysis* section should include a description that links the study variables to specific predictions. It should also provide a rationale for the proposed statistical analyses that will be conducted for hypothesis/prediction to be tested. Additionally, this section should have a discussion of the implications of supporting or not supporting each prediction. A meeting to defend the dissertation *proposal* should be completed **by the start of the fourth year in the program for students starting with a bachelor's degree, and the start of the third year for students starting the program with a master's degree.**

The final dissertation document includes the updated introduction information and literature review. Each study conducted for the dissertation should have an individual rationale section with supporting literature review if needed, detailed method section, results section, and discussion section. This should be followed by a general discussion and conclusion section as needed. The dissertation document should adhere to ASU graduate school guidelines and APA style 6th ed.

The dissertation process is scheduled for one-year in the timeline. However, it is open ended depending on the needs of the dissertation. It is likely that the process will extend to two years, and possible that it will extend beyond that depending on the scope and needs of the student and dissertation objectives. The timeline should be generated with the advisor and approved by the committee at the time of the dissertation proposal.

- Define research questions
- Develop appropriate methodology for investigating questions
- Collect and analyze data
- Write thesis
- See graduate.asu.edu/graddeadlines.html for graduation deadlines
- Your advisor/committee chair determines that the dissertation is ready to defend.
- Determine mutually convenient date/time for you and your committee for a defense. Prepare for at least two hours.
- Send your dissertation document to your committee at least 10 days prior to your defense.
- Schedule oral defense with Graduate College at least 10 days before defense date. See <https://graduate.asu.edu/current-students/policies-forms-and-deadlines/graduation-deadlines> for the 10 working day calendar that includes scheduled blackout dates for defenses.
- Submit dissertation to Graduate College for format approval and to committee members at least 10 days before the scheduled defense
- Prepare abstract, title, and bio announcement and email to your advisor for dissemination across the school. The defense is open to the public.
- Hold an oral defense; The committee chair should bring the appropriate form to the defense. Before the defense/exam begins, the committee should meet without the student and public attendees to discuss and agree upon the questioning format. During the defense, the student presents an approximately 45 minute summary of the dissertation work. Questions of clarification can be asked throughout. Committee questioning on substantive issues will follow the presentation and questions from the public. When there are no more questions from the committee, the student and public leave the room and the committee comes to consensus on the defense outcome: pass, pass with revisions or fail. If there are revisions, they are documented on the form, and a plan is made for addressing them.
- Submit final dissertation to UMI/ProQuest

It is critical that students establish a timeline for completing a dissertation by the stated graduation deadlines. It is best to identify the critical deadlines and work backwards with these constraints in mind.

- Set up your defense date early in the semester in which you will defend. It's important to note that due to scheduling conflicts and faculty commitments, all graduating students cannot defend on the same day. Please work with your faculty to establish a defense date and time.
- The final advisor approved document needs to be given to your committee to review at least ten days ahead of the defense.
- The advisor needs to iterate on the document with you. The introduction and methods should have been reviewed at the time of the proposal so most of this review will concern data analysis and interpretation of the data. This process should be iterative and can take some time. Advisors need at least a week to review each iteration. Meetings on the data analysis with your advisor during this period are strongly encouraged. The process can take 6-12 weeks depending on the revisions needed in each iteration.
- Data analysis can take some time as well, depending on your experiment. Allow adequate time for this.
- Data collection may take days to weeks depending on the nature of your experiment(s). Remember that not everything will go as planned so you might want to add buffer time to your schedule.
- You should complete an IRB protocol as soon as you have an approved proposal. Once the forms are submitted it may be processed quickly, but iterations are generally needed.

BS to PhD Milestones

Students enrolling directly from their bachelor's degree must follow a more detailed path to PhD completion to ensure all 84 credit hours are taken in order to fulfill the program requirements.

Milestone	Action	Deadline <i>(earlier is always better)</i>
Deficiencies	Identify and address course deficiencies	Identify: time of admission; Address: by the end of your first semester
Research	Engage in research – Early and Often	Start in first semester and continue through the program
Course Work	Take required courses and electives	See plan of study – MS coursework finished by end of Year 2
Exploration	Identify faculty advisor (one has been assigned but you may want to change) and initial research topic	End of Semester 1

Development	Identify research question	End of Semester 2
Proposal	Submit thesis proposal	End of Semester 3
Synthesis	Complete thesis, which will serve as the qualifying exam for the PhD	End of Semester 4
Master's in Passing (MIP)		
Course Work	Continue taking required courses and electives	See plan of study; required courses in three categories complete by end of Semester 8
Committee	Establish a PhD Committee	When you have settled on a dissertation topic with your faculty advisor (in Semesters 7-8).
iPOS[^]	Submit your Interactive Plan of Study (iPOS)	When you have a committee and no later than when you have registered for (NOT completed) 50% of PhD coursework. <i>Preference to have submitted by the 4th semester.</i>
Comprehensive Exam	Complete a literature review that serves as the comprehensive exam	Take by the end of the fourth year and no later than the fifth year
Dissertation	Complete your Dissertation Project and Defend it	Around the end of your fifth year in the program

**This can be the initial exploration of an area that may lead to a dissertation topic or it could be some research from a lab in which you are conducting research. It is a culmination of your first two years. After this milestone, you are eligible for a Masters in Passing*

^Students wishing to apply for master in passing need to work with graduate advising on the MIP iPOS prior to semester 4.

Annual Progress Reports

Students will complete a report of their progress towards degree requirements in the spring semester and will receive written feedback in the summer. Feedback and guidance will be provided on how students are progressing, or need to improve, in terms of coursework, research, and professional development.

Each spring an updated copy of the student's CV (that includes teaching and conference papers or journal publications) will be requested. Students are also asked to provide a 1-2 page synopsis of progress in the HSE program that year (as applicable/available: dissertation topic/proposal advisor selection, committee selection, research experiences, course work and Program of Study progress, lit review or proposal progress, brown bag participation, conferences, etc.) and some bullets that outline

their objectives for the next academic year. Students can include anything else about their experiences in the HSE program this year that they deem pertinent to this assessment. This information will be circulated to the HSE faculty, core course instructors, and advisor who will provide students with a letter evaluating progress in the program.

The purpose of these Annual Progress Reports is threefold. First, we wish to encourage students to formalize their plans for completion of their degree. Second, we wish to provide specific and formative feedback from the HSE faculty on students' progress. Third, we wish to help you monitor and address any barriers to your progress (e.g., coursework, administrative issues, and project development).

In addition, students are strongly encouraged to meet with their advisor(s) on a regular basis.

Labs & Research

Discover the eight vibrant human systems engineering laboratories located within the Ira A. Fulton Schools of Engineering's Polytechnic School. Here we conduct research on how people interact with technology and with each other, and work to improve these processes with innovations in human-centered system design and training.

Applied Attention Research (AAR) Lab

Research Interests: attention and human factors in cyberspace defense, attention in multitasking, human-automation interaction, human-machine teaming

Director: Robert Gutzwiller Assistant Professor / robert.gutzwiller@asu.edu

Applied Psychonomics and Ecological Simulations (APES) Lab

Research Interests: social cognition, evolutionary psychology, emotions as modulators of cognition and behavior, agent-based models of complex social systems.

Director: Vaughn Becker Associate Professor / vaughn.becker@asu.edu

ASU Advanced Distributed Learning Partnership Laboratory

Research Interests: This lab is an official collaboration between the US Department of Defense and Arizona State University to improve the understanding and implementation of distributed learning techniques into learning ecosystems.

Director: Scotty D. Craig Associate Professor & Nancy J. Cooke Professor / scotty.craig@asu.edu, nancy.cooke@asu.edu

Automation Design Advancing People and Technology (ADAPT) Laboratory

Research Interests: human-computer interaction, trust in automation, accountability and fairness, sociotechnical systems, resilience engineering, health systems.

Director: Erin K. Chiou Assistant Professor / erin.chiou@asu.edu

Center for Human, Artificial Intelligence, and Robot Teaming (CHART)

One of the centers of ASU's Global Security Institute which focuses on the coordination of teams composed of multiple humans and synthetic agents.

Director: Nancy J. Cooke Professor / nancy.cooke@asu.edu

Cognitive-Based Applied Learning Technology (CoBALT) Laboratory

Research Interests: learning sciences, multimedia learning, virtual humans, learning and training with technology.

Director: *Scotty D. Craig Associate Professor / scotty.craig@asu.edu*

Cognitive Engineering Research on Team Tasks (CERTT) Laboratory

Research Interests: team cognition, human-autonomy teaming, team science, remotely piloted aircraft systems

Director: *Nancy J. Cooke Professor / ncooke@asu.edu*

Perception and Action Laboratory (PAL)

Research Interests: perception and cognition in driving, flying and sports, multisensory interface development, sports training, simulator development, intelligent transportation systems

Director: *Rob Gray Associate Professor and Program Chair / robgray@asu.edu*

Sustainable Learning and Adaptive Technology for Education Laboratory

Research Interests: self-regulated and self-directed learning in authentic settings, deep learning experiences, adaptive educational technologies, learning with real-world impact

Director: *Rod Roscoe Assistant Professor / rod.roscoe@asu.edu*

Faculty

HSE Executive Committee (EC)

Scotty Craig (FSE TPS HSE), EC Chair

Vaughn Becker (FSE TPS HSE)

Mary Niemczyk (FSE TPS AMT)

HSE Graduate Faculty

A current list of graduate faculty within the Human Systems Engineering program is available below.

As this list changes during the academic year, a more comprehensive list can be found at:

<https://poly.engineering.asu.edu/hse/grad-faculty/> or

<https://graduateapps.asu.edu/graduate-faculty/degree/TSSMACSPHD>

Faculty Name	Faculty Department (if not same as PhD program)	Chair	Co-chair	Member
Ahn, Gail-Joon	FSE CIDSE	X		
Amresh, Ashish	FSE CIDSE	X		
Anderson, Derrick	SPA		X	
Atkinson, Bob	FSE CIDSE	X		
Aukes, Dan	FSE TPS		X	
Bansal, Ajay	FSE CIDSE		X	
Becker, David (Vaughn)	<i>Human Systems Eng</i>	X		

Bekki, Jennifer	FSE TPS	X		
Brunhaver, Samantha	FSE TPS	X		
Carberry, Adam	FSE TPS		X	
Chiou, Erin	<i>Human Systems Eng</i>	X		
Cooke, Nancy J.	<i>Human Systems Eng</i>	X		
Craig, Scotty	<i>Human Systems Eng</i>	X		
Gary, Kevin	FSE CIDSE	X		
Gray, Rob	<i>Human Systems Eng</i>	X		
Gutzwiller, Robert	<i>Human Systems Eng</i>	X		
Hall, Richard	EDHCI			X
Janssen, Marco	SHESC	X		
Johnson, Nathan	FSE TPS	X		
Kang, Yun	Applied Sciences and Mathematics		X	
Levy, Roy	The Sanford School			X
Madakannan, Arunachalanadar	FSE TPS	X	X	
Mayyas, Abdel Ra'ouf	FSE TPS	X		
McDaniel, Troy	FSE TPS	X		
McKenna, Ann	FSE TPS	X		
Nelson, Brian	FSE	X		
Niemczyk, Mary	FSE TPS	X		
Peng, Xihong	Applied Sciences and Mathematics		X	
Rajadas, John	FSE TPS		X	
Redkar, Sangram	FSE TPS	X		
Roscoe, Rod	<i>Human Systems Eng</i>	X		
Takahashi, Timothy	FSE SEMTE	X		
VanLehn, Kurt	FSE CIDSE	X		
Zhang, Wenlong	FSE TPS		X	

Abbreviations:

FSE: Fulton Schools of Engineering

CIDSE: School for Computing Informatics, and Decisions Systems Engineering

HSE: Human Systems Engineering (Polytechnic School)

EGR: Engineering (Polytechnic School)

TPS: The Polytechnic School

SEMTE: School for the Engineering of Matter, Transportation, and Energy

SPA: School of Public Affairs

EDHCI: Edson College of Nursing and Health Innovation

Other Affiliated Faculty

These are faculty who may be appropriate for your PhD committee. To include them, they need to apply to be on the HSE graduate faculty (involves sending a CV to the HSE Executive Committee). Contact Nancy Cooke for more details.

Nia Amazeen, Psychology
Eric Amazeen, Psychology
Prasad Boradkar, Industrial Design
Micki Chi, Psychology
Art Glenberg, Psychology
Steve Goldinger, Psychology
Mark Henderson, FSE
Don Homa, Psychology
Tim Lindquist, CIDSE FSE
Darryl Morrell, CIDSE FSE
Ben Ruddell, FSE
John Takamura, Industrial Design

Academic and Faculty Advising

The Polytechnic School Graduate Advising Office is responsible for advising all PhD Human Systems Engineering students with respect to progress toward the degree as well as program, school, college, and university-wide ASU Policies and Procedures. Questions involving details of academic content in courses, professional practice, and research can be discussed with faculty advisors or the Graduate Program Chair.

Graduate Academic Advising

Meghan Vaughn
Academic Success Coordinator
Wanner Hall, First Floor
polygrad@asu.edu
480-727-4723
[Schedule an appointment](#)

Graduate Program Chair

Dr. Scotty Craig
Associate Professor and Program Chair, HSE
SANCA150G
scotty.craig@asu.edu
480-727-1006

Brown Bag Seminars

For 2019-2020, these are held bi-weekly and they are open to the public (registration not necessary to attend). But these are for you! They are intended to give you exposure to different research areas and career possibilities, provide an opportunity to present your research, help you make connections, etc. It is the time that the HSE graduate faculty and students come together. They have been taking place on Wednesdays at noon. The day and time may change. You will receive details weekly through email. Attendance is mandatory. (If you are unable to attend face to face there is an on-line attendance option, but in-person attendance is preferred.)

Policies for Evaluation and Dismissal

Students should familiarize themselves with the ASU Graduate College policies:

<https://graduate.asu.edu/current-students/policies-forms-and-deadlines/policy-manuals>

especially regarding degree requirements, academic integrity, maintaining progress, and appeals.

Satisfactory academic progress will be defined by the quality of the student's work (classroom, research, service) in the HSE program and the student's ability to achieve milestones in a timely fashion, as judged by the advisor, HSE Executive Committee, and eventually the student's PhD committee. Students will complete a progress report at the end of every academic year and will be provided with written feedback by the HSE EC (drawing from other relevant faculty) soon thereafter. In the case of unsatisfactory progress, the feedback will explicitly provide objectives to be met to avoid dismissal from the program.

HSE Recommended Campus Resources

The Polytechnic campus has various resources for students. Because hours, services, and student needs vary, it is up to you to investigate all application options. Some noteworthy resources are as follows:

Graduate and Professional Student Association (GPSA)

The GPSA is the graduate student government organization at ASU. They offer a variety of services including limited funding opportunities for research and traveling to conferences. The GPSA at Poly is located in the Admin Building. For more information, visit their website: <http://gpsa.asu.edu/>.

Polytechnic Library

The library on our campus is located on the lower level of the Center Building.

Student Financial Aid Office at Polytechnic

The Polytechnic Financial Aid Office is located in the Admin Building. For more information, visit their website: <https://students.asu.edu/contact/financialaid>.

Graduate Advising Office

Graduate students have two advisors: a faculty advisor and a college advisor. The faculty advisor (committee chair) serves as the student's academic mentor and oversees the research and dissertation progress. The college advisor (Meghan Vaughn) is our college's liaison with the ASU Graduate College. Graduate Students are held to certain departmental standards as well as university standards. The college advisor's role is to answer policy and procedural questions related to the Graduate College and to refer students to appropriate departments or resources. The Graduate Advising Office is located on the first floor of Wanner Hall. Appointments are made with Meghan Vaughn by calling 480-727-4723 or by visiting the [**online scheduling tool**](#). She can also be reached by email at meghan.vaughn@asu.edu.

Student Organizations

There are various student organizations at ASU. You can join as many as you want and you're not bound by campus affiliation. If you do not see a club you'd like to be a part of, start your own. For

details and a list of organizations, go to <https://students.asu.edu/clubs>. HSE recommends involvement in the student chapter of the Human Factors and Ergonomics Society.

On behalf of the HSE Graduate Faculty, we wish you a productive and successful graduate career. Please let us know if there is anything we can do to better support your progress through the program.

Scotty Craig
Chair, HSE Executive Committee

Polytechnic School Overview

About the Polytechnic School

The Polytechnic School is making a new higher education experience, one that focuses on learning through making things and solving real-world challenges through collaboration. At the Polytechnic School, we believe how you learn and teach is as important as what you learn and teach. We are committed and contributing to ASU's vision of the New American University – an institution that is committed to excellence, access, and impact.

The Polytechnic School is located in Mesa, which is the state's third-largest city and part of the Greater Phoenix area. The 600-acre ASU Polytechnic campus is built in a beautiful desert arboretum and is home to more than 4,450 students studying in undergraduate and graduate majors. The Polytechnic School is home to some of the most innovative engineering and technology programs in the country and some of the most advanced learning laboratories available to students on any university campus.

The programs thrive under the guidance of more than 100 outstanding faculty members with deep expertise in many of the most important challenges that society faces.

Visit the Polytechnic School website at poly.engineering.asu.edu. For more in-depth information about the programs offered through the Polytechnic School as well as the application process and other pertinent information, you are encouraged to explore the [overview of the graduate programs](#).

Graduate Programs

The Polytechnic School's graduate students learn in an environment that blends management, applied sciences, and engineering and technology fields to create applications, systems, and solutions that meet real-world needs. We engage in research that matters. As part of the Polytechnic School masters programs, applied projects, theses, and research are degree components and complement students' theoretical and practical understanding. The Polytechnic School doctoral programs include separate degree components, all of which are outlined in each program's handbook.

Masters Degrees

- Aviation Management and Human Factors, MSTech in Technology Engineering, MS
- Environmental and Resource Management, MS
- Environmental and Resource Management (Water Management), MS
- Graphic Information Technology, MS
- Human Systems Engineering, MS
- Information Technology, MS
- Management of Technology, MSTech in Technology

Manufacturing Engineering, MS
Robotics and Autonomous Systems (Systems Engineering), MS
User Experience, MS

Doctoral Degrees

Engineering Education Systems and Design, Ph.D.
Human Systems Engineering, Ph.D.
Systems Engineering, Ph.D.

Programs No Longer Admitting Students

Environmental Technology Management, MSTech in Technology
Graphic Information Technology, MSTech in Technology

Purpose of this Handbook

The purpose of this handbook is to provide guidance and information related to admission, degree requirements, and general policies and procedures for graduate students in the Polytechnic School. Students must adhere to policies of both the Polytechnic School and the Graduate College. Policies and this handbook are subject to change at any time; students will be notified.

Student Responsibility

Graduate students are responsible for familiarizing themselves with all university and graduate policies and procedures as well as applicable deadlines. Each student should also communicate directly with his/her academic unit to be clear on its expectations for degree completion. Graduate students are responsible for frequently checking their **My ASU** account and **asu.edu email** for the most up-to-date information regarding their status, holds, items to attend to, and other important information.

Facilities and Labs

The core facilities, laboratories, and centers in the Polytechnic School provide the ideal environments for teaching, research, and discovery. State-of-the-art equipment and technologies help students increase their knowledge and experience and provide support for the use-inspired research conducted by the school's faculty and students. Learn more by visiting: **Labs and Facilities**.

Faculty

Faculty members have significant expertise in many of the most important challenges that society faces. Many members of the faculty bring considerable industry experience to bear on their teaching and research. To learn more about the faculty, you may refer to the **Polytechnic School Directory**.

Assistantships

Graduate students may apply for teaching or research assistantships. Assistantships are competitive

and not guaranteed with admission. Shortly following admission, doctoral students will receive an opportunity to apply for a teaching assistantship (TA).

Research assistantships (RA) are awarded by the individual faculty members. Students interested in a research assistantship should review the faculty areas of research and contact faculty based on their interest in those areas to discuss the possibility of funding further.

Students awarded an assistantship within the Ira A. Fulton Schools of Engineering are required to register for 12 credits each semester in which the assistantship is held. Research hours may be used towards the 12 credit requirement.

International students are required to meet English proficiency requirements in order to be eligible for a teaching assistantship. More information about those requirements can be found here: <https://learnenglish.asu.edu/international-teaching-assistant>.

For more information regarding TA/RA policies, tuition remission and benefits associated with an assistantship, please review the ASU Graduate College TA/RA handbook: <https://graduate.asu.edu/current-students/funding-opportunities/graduate-appointments-and-assistantships>.

Graduate Advising

Graduate student advising is located on the Polytechnic campus in **Wanner Hall** on the first floor. For more information about the Polytechnic School graduate programs or the policies in this handbook, contact the graduate advising office at polygrad@asu.edu or **480-727-4723**.

Academic Standards and Policies

Grades

To be eligible for graduation and the completion of a graduate degree, a student must achieve a cumulative grade point average (GPA) of 3.0 or better in three different grade point average calculations. The three different grade point averages that are considered by Graduate College and the Polytechnic School are as follows: **(1)** the grade point average in all courses numbered 500 or higher that appear on the transcript, except those that were listed as deficiencies in the original letter of admission, **(2)** the grade point average in all coursework that appears on the approved program of study, and **(3)** the grade point average in all coursework taken at ASU post baccalaureate.

Transfer credits are not calculated on the Plan of Study (iPOS) GPA or the Graduate GPA. Courses with grades of “D” (1.00) and “E” (0.00) cannot appear on the iPOS but will be included when calculating the Graduate GPA. Courses with an “I” grade cannot appear on the iPOS.

A student who is not progressing satisfactorily toward a degree will be withdrawn from the program by the Dean of the Graduate College upon recommendation by the Fulton Schools of Engineering

Dean's office. The policy of the Polytechnic School for academic probation and dismissal of graduate students is outlined below.

Satisfactory progress is defined by the quality of the student's work, that it does not have any academic and progress probationary issues, and that the student is meeting all requirements and/or milestones applicable to their program. Specifically for Doctoral students, this also includes the successful completion of the qualifying and comprehensive exams, as determined by their program. In addition to the probationary rules, satisfactory progress includes appropriate communication each semester with the student's Committee Chair regarding his or her progress, if applicable.

Students in the accelerated degree programs (4+1) will have separate requirements to meet while completing their undergraduate degree. See accelerated bachelor's + master's degree program (4+1) section above for more information. Once students are in the graduate portion of the program (and have completed their undergraduate degree), they must meet the graduate academic expectations outlined in this section.

Academic Performance Standards

To meet the Polytechnic School academic performance requirements, all students admitted to a graduate degree program in the Polytechnic School must adhere to all of the following:

All students admitted to a graduate degree program in the Polytechnic School, either on a regular or provisional admission status, must maintain a 3.0 or higher grade point average (GPA) in:

1. All work taken for graduate credit (courses numbered 500 or higher),
2. Coursework in the student's approved plan of study (iPOS), **and**
3. All course work taken at ASU (overall GPA) post baccalaureate.

Earn a "C" or better in all iPOS (plan of study) courses. Grades of "W" and "I" are not acceptable on the iPOS and may be considered lack of satisfactory progress if more than one occurrence during the students' graduate program of study. Programs may invoke a higher standard, e.g., no courses with a C may be included on the iPOS.

Meet the terms of the ASU Graduate College satisfactory progress policies as outlined at: **ASU Graduate Policies and Procedures.**

Evaluation of Academic Performance Requirements

After each semester, the academic unit reviews students' files for satisfactory progress towards completion of the degree. All students are placed under one of the three categories:

- **Satisfactory Progress** means that the student does not have any academic and progress probationary issues. In addition to the probationary rules, satisfactory progress includes appropriate communication each semester with the student's Committee Chair regarding his or her progress, if applicable.

- **Academic Probation** pertains to grades that fall below those required by Program and University policies, including graduation requirements. The following are notices/letters the student will receive if one of these pertains to their academics:

Grade Point Average

- > GPA below 3.0 in approved iPOS courses
- > Overall post baccalaureate GPA below 3.0
- > Overall graduate (500 level or above) GPA below 3.0

Deficiency Course(s)

- > Lack of progress toward completion of required deficiencies as listed on the admission letter
- > Received a “D” or “E” in a required deficiency course or in a course at the 400 level or above
- > Deficiency GPA below 3.0

Students placed on academic probation will have nine (9) credits or one year, whichever comes first, to meet Satisfactory Progress and GPA requirements as outlined above.

- A student will be recommended for **Withdrawal** from the program if she or he fails to meet the probationary standards outlined in their probationary letter. The student will receive a letter from the Polytechnic School explaining the reasons for recommendation for withdrawal. The student will have five (5) business days from the date of the letter to appeal the decision. The department’s Graduate Affairs Committee (GAC) will review the appeal and will make the necessary recommendation. The GAC Chair, on behalf of the GAC, will provide a written explanation of the outcome of the appeal.
 - If the outcome is favorable, the student will have to meet all the outlined requirements at the end of the specified period. The student will be required to sign an agreement acknowledging the recommendations of the GAC and the consequences if the agreements are not met.
 - If the GAC recommends that the appeal is not granted in favor of the student, the GAC Chair, on behalf of the GAC, will recommend to the Fulton Schools of Engineering (FSE) Dean’s Office to withdraw the student from the graduate program. The student’s appeal will then be reviewed by the FSE Academic Standards Committee, which reviews the student’s case and makes the final recommendation on behalf of the FSE Dean’s Office and the department. If the appeal is not granted in favor of the student, the Fulton Schools of Engineering Dean’s Office will recommend to the Graduate College to withdraw the student from the graduate program. Please refer to the Graduate College catalog for policies and procedures or contact the graduate advisor in the Polytechnic School with further questions.

Plan of Study (iPOS)

The Plan of Study (iPOS) functions as a contract between the student, the academic unit, and the Graduate College. The iPOS contains certain degree requirements such as core and elective coursework as well as a culminating experience, which must be included in the iPOS before it can

be approved. Students should submit an iPOS after registering for their second semester in the program. Students **must** submit an iPOS before completing 50 percent of the credit hours required for their degree program. A student is not eligible to schedule the comprehensive examination without an approved iPOS.

A student can access the iPOS by visiting [My ASU](#) > My Programs > iPOS > Graduate Interactive Plan of Study (iPOS). Please reference our [iPOS Overview](#) for in-depth information on what must be included on the iPOS.

Students may not register for dissertation credit (799) until their iPOS is submitted and approved.

Time Limit for Degree Completion

All work toward a master's degree must be completed within six consecutive years. Doctoral students must complete all program requirements within a ten-year period. The time period begins with the semester and year of admission to the program. Graduate courses taken prior to admission that are included on the Plan of Study must have been completed within three years of the semester and year of admission to the program. See the [ASU Graduate Policies and Procedures](#) for more information.

Continuous Enrollment Policy

Once admitted to a graduate degree program, students must be registered for a minimum of one credit hour of graduate-level coursework (not audit) during each fall and spring semester of their graduate education. Summer registration is required for students taking examinations, completing culminating experiences, conducting a doctoral prospectus, defending theses or dissertations, or graduating from the degree program in that semester. This credit must appear on the Plan of Study **or** must be an appropriate graduate-level course (e.g. 595, Continuing Registration). Courses with grades of "W" and "X" are not considered valid registration for continuous enrollment purposes.

Students who have completed all necessary coursework but still need to complete research work towards their dissertation can [request an override](#) for 595 Continuing Registration for 1 credit hour to maintain active status in their program.

Leave of Absence Policy

Students planning to discontinue enrollment for a semester or more must request approval for a leave of absence through the Plan of Study (iPOS) petition titled *Request to Maintain Continuous Enrollment*. The Graduate College allows for a leave of absence for a maximum of two semesters during a student's entire program. A petition for a leave of absence ([Request to Maintain Continuous Enrollment](#)), endorsed by the student's faculty advisor and the department chair, must be approved by the Graduate College. This request must be submitted and approved **before** the start of the semester of the anticipated absence.

An approved leave of absence will enable students to re-enter their program without reapplying to the university and the graduate program. Students who do not enroll for a fall or spring semester and

do not have an approved Request to Maintain Continuous Enrollment are considered withdrawn from the university under the assumption that they have decided to discontinue their program. A student removed for this reason may reapply for admission to resume their degree program; the application will be considered along with all other new applications to the degree program.

A student with a Graduate College-approved Request to Maintain Continuous Enrollment is not required to pay tuition and/or fees, but in turn is not permitted to place any demands on university faculty or use any university resources. See the **ASU Graduate Policies and Procedures** for more information.

Graduate College Policies and Procedures

All graduate students are expected to read, understand and meet the terms of the ASU Graduate College Policies and Procedures handbook as outlined at: **ASU Graduate Policies and Procedures**.

Policy on Maximum Course Load

Registration in nine (9) credits is considered a full-time load for graduate students at ASU, and graduate students in the Ira A. Fulton Schools of Engineering are restricted to a maximum of 12 credits per semester. Overrides to register for more than 12 credits require the approval of the student's committee chair and Graduate Program Chair and will be granted only in exceptional cases. Requests to register for more than 15 credits will not be supported.

Internships

Polytechnic School graduate students can request to take internship as a XXX 584 course option for academic credit if an approved and eligible internship is obtained. Internship is not a requirement for graduate programs within The Polytechnic School, but can be added as a planned option to the graduate plan of study. International students can apply for curricular practical training (CPT) if eligible to do so. No more than 3 credits of internship coursework can be used. The 3 credits can be divided between a maximum of two semesters for two different internship opportunities. For more information on internships, policies, and the application process, please visit:

<https://poly.engineering.asu.edu/cpt/>.

Applying for Graduation

Graduate students should become familiar with the process of applying for graduation to ensure the **graduation application** is submitted by the deadline of the graduating semester. The University has specific deadlines each semester for submitting the Graduation application. To view the specific deadlines for future terms, log into MyASU and click on the Graduation tab. Please also be sure to review the Graduate College **graduation deadlines and procedures** as well. All students must have an approved and up-to-date iPOS on file in order to apply for graduation.

General ASU Information

Academic Calendar

Students are responsible for meeting all deadlines set within the ASU Academic Calendar. The calendar can be found at students.asu.edu/academic-calendar.

Student Code of Conduct

The aim of education is the intellectual, personal, social, and ethical development of the individual. The educational process is ideally conducted in an environment that encourages reasoned discourse, intellectual honesty, openness to constructive change, and respect for the rights of all individuals. Self-discipline and a respect for the rights of others in the university community are necessary for the fulfillment of such goals. The Student Code of Conduct is designed to promote this environment at Arizona State University.

The Student Code of Conduct sets forth the standards of conduct expected of students who choose to join the university community. Students who violate these standards will be subject to disciplinary sanctions in order to promote their own personal development, to protect the university community, and to maintain order and stability on campus.

All students are expected to adhere to the [ABOR Student Code of Conduct](#).

Academic Integrity

The highest standards of [academic integrity](#) and compliance with the university's Student Code of Conduct are expected of all graduate students in academic coursework and research activities. The failure of any graduate student to uphold these standards may result in serious consequences, including suspension or expulsion from the university and/or other sanctions as specified in the academic integrity policies of the Polytechnic School as well as the University.

Violations of academic integrity include, but are not limited to: cheating, fabrication of data, tampering, plagiarism, or aiding and/or facilitating such activities. At the graduate level, it is expected that students are familiar with these issues and take personal responsibility in their work. It is the student's responsibility to become familiar with the academic integrity policies of the university and Graduate College.

Department and University Resources

- Academics and Professional Development
 - [Academic Integrity Policy](#)
 - [ASU libraries](#)
 - Career Centers (both [ASU](#) and [Fulton Schools of Engineering](#))
 - [Graduate and Professional Student Association](#)

- Polytechnic School graduate student resources and forms
- Professional development
- Writing Center

- Student Support Services
 - Counseling
 - Disability Resources
 - Graduate Wellness Resources
 - 10 Best Practices in Graduate Student Wellbeing
 - Health
 - Housing
 - International Student Services
 - Veterans

- Business and Finance Services
 - ASU ID cards
 - ASU bookstore
 - Parking and Transit
 - Student accounts

Contact Information

For more information about the Polytechnic School graduate programs or the policies in this handbook, contact the graduate advising office at polygrad@asu.edu or 480-727-4723.

Appendix A

Plan of Study Outline – Bachelor's to PhD

Plan of Study (iPOS) Outline

HSE PhD

Bachelor's directly to PhD



A minimum of 84 semester credit hours are required for the Human Systems Engineering (HSE) PhD degree, distributed as follows:

- 30 credit hours** of coursework reflecting the master's degree program requirements. (No more than two 400-level courses may be included on the iPOS):

Course	Title	Term
HSE 520**	Methods & Tools in Applied Cognitive Science	
PSY 530	Intermediate Statistics	
HSE 542**	Foundations of Human Systems Engineering	
HSE 531	Data Analytics	
HSE 592	Research	
Elective		
Elective		
Elective		
HSE 599	Thesis	
HSE 599	Thesis	

***Required courses for students entering the program directly from a Bachelor's degree*

- Qualifying exam.** Complete a Thesis Project within the first two years. This will serve as the qualifying milestone for the PhD program.

- Four *foundation* courses chosen in conference with your faculty/committee chair, totaling **12 credit hours**:

Course	Title	Term
HSE 540*	Foundations of Applied Cognitive Science	

- Three *tools and methods* courses chosen in conference with your faculty/committee chair, totaling **9 credit hours**:

Course	Title	Term
HSE 521*	Methods and Tools in Human Systems Engineering	

- Three *applications* courses chosen in conference with your faculty/committee chair, totaling **9 credit hours**. (No more than two 400-level courses may be included on the iPOS):

Course	Title	Term

- Two *electives* courses chosen in conference with your faculty/committee chair, totaling **6 credit hours**. Additional credits of HSE 792 Research are permitted to fulfill this area. (No more than two 400-level courses may be included on the iPOS):

Course	Title	Term

- Comprehensive Exam** It is expected that the comprehensive exam will be completed by the end of the third year and no later than the fourth year.

- Six *research and scholarship* courses chosen in conference with your faculty/committee chair, totaling **18 credit hours**:

Course	Title	Term
HSE 792	Research	
HSE 792	Research	

HSE 799	Dissertation	
HSE 799	Dissertation	
HSE 799	Dissertation	
HSE 799	Dissertation	

Human Systems Engineering PhD students must also select 3 committee members by their last year in the program. Please use this section to list faculty members you are considering:

Committee Chair: _____

Committee Member #1: _____

Committee Member #2: _____

**The required core courses for this program include HSE 520, HSE 521, HSE 540, and HSE 542.*

Appendix B

Plan of Study Outline – MS to PhD

Plan of Study (iPOS) Outline

HSE PhD

Previous Master's Degree Earned



A minimum of **84 semester credit hours** are required for the Human Systems Engineering (HSE) PhD degree, distributed as follows:

- A maximum of **30 credit hours** of coursework from a previous Master's degree in Psychology, Engineering, Cognitive Science, Computer Science, or related field may be applied to the PhD.

- Four *foundation* courses chosen in conference with your faculty/committee chair, totaling **12 credit hours**:

Course	Title	Term
HSE 540*	Foundations of Applied Cognitive Science	
HSE 542*	Foundations of Human Systems Engineering	

- Three *tools and methods* courses chosen in conference with your faculty/committee chair, totaling **9 credit hours**:

Course	Title	Term
HSE 520*	Methods and Tools in Applied Cognitive Science	
HSE 521*	Methods and Tools in Human Systems Engineering	

- Qualifying exam.** Upon completion of all four core courses and the selection of an advisor/co-advisors, all students must complete their first year project, which serves as the qualifying exam.

- Three *applications* courses chosen in conference with your faculty/committee chair, totaling **9 credit hours**. (No more than two 400-level courses may be included on the iPOS):

Course	Title	Term

- Two *elective* courses chosen in conference with your faculty/committee chair, totaling **6 credit hours**. Additional credits of HSE 792 Research are permitted to fulfill this area. (No more than two 400-level courses may be included on the iPOS):

Course	Title	Term

- Comprehensive Exam** It is expected that the comprehensive exam will be completed by the end of the second year and no later than the third year.

- Six *research and scholarship* courses chosen in conference with your faculty/committee chair, totaling **18 credit hours**:

Course	Title	Term
HSE 792	Research	
HSE 792	Research	
HSE 799	Dissertation	
HSE 799	Dissertation	
HSE 799	Dissertation	
HSE 799	Dissertation	

Human Systems Engineering PhD students must also select 3 committee members by their last year in the program. Please use this section to list faculty members you are considering:

Committee Chair: _____

Committee Member #1: _____

Committee Member #2: _____

**The required core courses for this program include HSE 520, HSE 521, HSE 540, and HSE 542.*

Appendix C

Qualifying Exam Instructions and Results Form

Qualifying Exam Instructions

Human Systems Engineering (HSE), PhD

We currently have two type of students in the program. Our traditional PhD program focused on students starting with a MS degree and completing in 3 years. We propose a new category which has students starting with an undergraduate degree and completing a 4-5 year program. These groups have different starting points with slightly different Qualifying Milestones. Students entering from an undergraduate program will complete a research-based thesis during their first 2 years. Students entering with an acceptable master's degree will have a similar research-based requirement of a first-year project during their first year. The milestones will then merge, with a more comprehensive literature review project serving as a comprehensive exam, followed by a traditional dissertation process.

Thesis – Students with a bachelor's degree

Incoming HSE PHD students with a bachelor's degree will be expected to complete a Thesis Project within the first two years. This will serve as the qualifying milestone for the PhD program and will grant students a MS Degree in Human Systems Engineering. Completion requires students participate with faculty to carry out original research. A member of the HSE graduate faculty must agree to serve as the faculty advisor before a student can choose to enroll in this option. This will require a written (including email) confirmation from the faculty advisor that they agree to serve in this capacity. The student, in consultation with the faculty advisor, must then identify at least two additional faculty members from the graduate faculty within the Fulton Schools of Engineering to serve on the MS in Human Systems Engineering thesis committee.

A thesis is a document that reflects and reports research that is of sufficient depth and interest that it can be published in a peer reviewed journal in the field of interest. The thesis document should demonstrate original, independent, and creative thought, demonstrate proficiency with written English, and adhere to the Graduate College format guidelines. Upon completion of the thesis, the student is required to defend the research in a public forum. Failure to complete this task or completion in an unsatisfactory manner (determined by the HSE faculty) will result in removal from the program.

First Year Project – Students with a master's degree

Incoming HSE PHD students with a master's degree will complete a first-year project that will serve as the qualifying milestone. This project would be conducted under the guidance of an advisor and approved by a committee of 3 HSE faculty. It could be a replication study, new research in the area of the advisor, or an independent idea proposed by the student and approved by the advisor. Students would be responsible for conducting all steps of the study and to write up a conference proceedings-style article (e.g., HFES or Cognitive Science Society) or journal, with the anticipation it will be submitted following the defense of the project and written article to a committee of 3 HSE faculty. Failure to complete this task or completion in an unsatisfactory manner (determined by the HSE faculty) will result in removal from the program.

Questions regarding the Qualifying exam should be directed to the HSE PhD Executive Committee.

Qualifying Exam Results

Human Systems Engineering (HSE) PhD



Name:	ID:
Address:	
Date of qualifying examination:	Phone:
Specialization area:	Advisor:
Title of research project:	

Please check the box for the draft version:

- Original Draft Draft after major revisions

Examination Results: To be completed by the examining committee.

- Pass Pass with minor revisions Pass with major revisions Fail

NAMES OF FACULTY	SIGNATURES
CHAIR	

Comments (optional):

Final Result: To be completed by HSE PhD Executive Committee Chair.

PASSED <input type="checkbox"/>	FAILED <input type="checkbox"/>	SIGNATURE	DATE
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GRADUATE ADVISOR	DATE RECEIVED
	DATE ENTERED IN PS

Appendix D

Comprehensive Exam Instructions and Results Form

Comprehensive Exam Instructions

Human Systems Engineering (HSE), PhD

For the PhD Comprehensive Exam, each student is required to write a literature review (approximately 20-40 pages in length) relevant to HSE and potentially, their dissertation topic. A literature review is not an annotated bibliography which summarizes articles that have been read, but is a coherent narrative that provides analysis, synthesis and a critical evaluation of the area. In doing so, the literature review should demonstrate best practices, organization, and insights as routinely found in published review articles. Students are strongly encouraged to examine published, well-cited review articles in relevant journals and use those sources as initial role models. This document would ideally be on the topic of the student's dissertation, and as part of the synthesis, would identify gaps and needs that form the bases for the dissertation work. Additionally, parts of this literature review document can be reused within the literature review of the dissertation proposal. This is expected to be a one-year process and should start in the summer following completion of the qualifying milestone. Failure to complete this task or completion in an unsatisfactory manner (determined by the HSE faculty) will result in removal from the program.

The six-step Literature Review process is as follows:

- First, the student will determine an appropriate topic with their adviser.
- Second, the student will write up a brief prospectus and reading list with guidance from the adviser. The student will present the prospectus to the committee for approval and recommendations for additional articles.
- Third, the student will write the literature review with guidance from the advisor.
- The fourth step will be the *initial* review. Students will submit their literature review document to the full committee for review and comments. Committee members will provide a critique of the review on quality and completeness and provide a list of revisions and follow-up questions. The follow up questions can be specifically on the topic of the review, or on how other HSE concepts relate to the topic.
- In the fifth step, students will have two weeks to provide written responses to questions and critiques.
- Finally, a *final defense meeting* will be scheduled in which the student will give a presentation covering the review, responses to initial review feedback, and answer any follow-up questions by the committee. This meeting can result in the need for an additional modification of the literature review document.

Questions regarding the Comprehensive Exam should be directed to the HSE PhD Executive Committee.

Comprehensive Exam Results

Human Systems Engineering (HSE) PhD



Name:	ID:
Date of comprehensive examination:	Phone:
Advisor:	
Title of research:	

Please check the box for the draft version:

- Original Draft Draft after major revisions

Examination Results: To be completed by the examining committee.

- Pass Pass with minor revisions Pass with major revisions Fail

NAMES OF FACULTY	SIGNATURES
CHAIR	

Comments (optional):

Final Result: To be completed by HSE PhD Executive Committee Chair.

PASSED <input type="checkbox"/>	FAILED <input type="checkbox"/>	SIGNATURE	DATE
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GRADUATE ADVISOR	DATE RECEIVED _____
	DATE ENTERED IN PS