

Systems Engineering (Ph.D.)

Degree Requirements

Degree Requirements For Systems Engineering (Ph.D.) — 67 Credit Hours

Case 1: With Engineering Bachelor's Degree Only

Case 1 Requirements	Hours
Core Systems Courses (SE 601, SE 606, SE 603, SE 602, SE 609)	15
Systems Engineering elective	3
Other Systems Engineering or Engineering Electives	30
Research Hours	19
Total credit hours required for completion	67

Case 2: With STEM Bachelor's Degree (Other Than Engineering)

Case 2 Requirements	Hours
Pre-requisite undergraduate courses to be determined at time of admission. It is highly recommended that the applicant have taken at least three semesters of calculus and a college level physics course.	TBD
Core Systems Courses (SE 601, SE 606, SE 603, SE 602, SE 609)	15
Systems Engineering elective	3
Other Systems Engineering or Engineering electives	30
Research Hours	19
Total credit hours required for completion	67

Case 3: With Engineering Master's Degree

Case 3 Requirements	Hours
Engineering Master's degree transfer credits (total transfer credits to be determined at the time of admissions)	24-30
Core Systems Courses (SE 601, SE 606, SE 603, SE 602, SE 609)	15
Systems Engineering electives	3-9
Research Hours	19
Total credit hours required for completion	67

Case 4: With STEM Master's Degree (Other Than Engineering)

Case 4 Requirements	Hours
Engineering Master's degree transfer credits to be determined at time of admission)	TBD
Core Systems Courses (SE 601, SE 606, SE 603, SE 602, SE 609)	15
Systems Engineering electives (total transfer credits to be determined at time of admission)	TBD
Research Hours	19
Total credit hours required for completion	67

Required Examinations

Required Examinations in the Systems Engineering PhD program have two parts. There is a written component, and an oral component to each. The exams are:

- Qualifying Exam: Written and Oral
- Proposal Defense: Written and Oral
- Dissertation Defense: Written and Public Oral Defense

Department Information

Systems Engineering Program Staff	(251) 460-7993
Chair	Robert Cloutier
Professor	John Usher
Assistant Professor	Kari Lippert
Assistant Professor	Sean Walker
Part-Time Instructor	Tom Wade

Systems Engineering Program website
<https://www.southalabama.edu/colleges/engineering/phd-se>

Doctor Of Philosophy (Ph.D.)

The Doctor of Philosophy (Ph.D.) in Systems Engineering offers students a holistic approach to the design and understanding of complex systems. NASA defines systems engineering as "a holistic, integrative discipline, wherein the contributions of structural engineers, electrical engineers, mechanism designers, power engineers, human factors engineers, and many more disciplines are evaluated and balanced, one against another, to produce a coherent whole that is not dominated by the perspective of a single discipline." At USA, we emphasize a model-based systems engineering approach (MBSE) in many of our courses. The main objectives of the Ph.D. program are to (1) provide our graduates with the ability to approach all systems (engineered, environmental, coastal, biological, social/organizational, etc.) with the ability to understand the entire system lifecycle in a manner that meets the needs of industry, and (2) prepare our graduates for leadership positions requiring applied research along with critical and creative thinking. This program is appropriate for students who want to pursue research-based careers in industry, government, or academia. The program requires coursework across multiple engineering disciplines, and specific, validated systems research resulting in a publicly defended doctoral thesis.

Requirements For Admission (With Master's Degree)

In addition to meeting Graduate School requirements, the requirements for admission with a Master's degree to the Ph.D. Program are as follows:

1. A written Statement of Purpose outlining the applicant's professional goals and commitment to completing the degree requirements.
2. Three letters of recommendation from individuals familiar with the student's academic and technical abilities.
3. A M.S. degree in a discipline related to engineering (e.g. civil, computer, chemical, electrical, industrial, mechanical engineering, etc.).
4. A B.S. degree in a discipline related to engineering (e.g. civil, computer, chemical, electrical, industrial, mechanical engineering, etc.) (The Ph.D. Admission committee reserves the right to review the coursework at the B.S. level before making any admission decision.)
5. A grade point average of 3.0 or greater (on a scale of 4.0) on all graduate coursework.
6. Applicants whose highest degree is a graduate degree from an accredited institution of higher education will not be required to provide GRE scores.
7. For international students whose native language is not English, a minimum score of 79 on the Internet-based TOEFL, or a minimum score of 213 on the computer-based TOEFL, or a minimum score of band 6.5 on the IELTS test, or a minimum overall score of 58 on the Pearson PTE Academic Test.
8. Official transcripts from all colleges and universities attended by the applicant.

Students may be required to present GRE scores to be eligible for some assistantships or fellowships.

Final admission decisions are made based upon an evaluation of the applicant's complete file which consists of all official academic transcripts, undergraduate grade-point average, GRE scores (when required), three letters of reference regarding the applicant's ability to succeed in the Ph.D. in Systems Engineering, the applicant's statement of purpose, and TOEFL or IELTS or iTEP or Pearson PTE Academic score (for International applicants), applicant's work history, program enrollment and funding availability if required by applicant.

Admission may be granted by the Systems Engineering Program Director in special cases where a holistic evaluation shows that the applicant's credentials and work experience are appropriate.

Requirements For Admission (With Bachelor's Degree)

In addition to meeting Graduate School requirements, the requirements for acceptance without a Master's degree are as follows:

1. A Bachelor's degree in a discipline related to engineering (e.g. civil, computer, chemical, electrical, industrial, mechanical engineering, etc.). Other STEM Bachelor's degrees MAY be considered if the degree led to working in an Engineering field and the applicant has gained experience. (Factors such as length of time and experience gained will be considered at the admission committee's discretion. The Ph.D. admission committee reserves the right to review the coursework at the B.S. level before making any admission decision.)
2. A grade point average of 3.0 or greater (on a scale of 4.0) on all undergraduate coursework.
3. A grade of B or higher for all graduate courses to be considered as transfer credits from previous institutions attended. Only graduate credits that have not been applied to another degree can be considered for transfer.
4. Official transcripts from all colleges and universities attended.
5. A minimum score of 151 in the Verbal portion and a minimum score of 151 in the Quantitative portion of the Graduate Record Examination (GRE) (see further details below).
6. For international students whose native language is not English, a minimum score of 79 on the Internet-based TOEFL, or a minimum score of 213 on the computer-based TOEFL, or a minimum score of band 6.5 on the IELTS test, or a minimum overall score of 58 on the Pearson PTE Academic Test.

Applicants for the Ph.D. program must submit officially certified scores on the Graduate Record Exam (GRE). This requirement is waived for students who received an engineering B.S. degree from the University of South Alabama. (Those students may be required, however, to present GRE scores to be eligible for some assistantships or fellowships.) Applicants holding a current P.E. license, or holding a Bachelor's degree in an engineering discipline (e.g. civil, computer, chemical, electrical, industrial, or mechanical engineering), or a minimum of five years of engineering work experience, may request that the GRE requirement be waived.

Final admission decisions are made based upon an evaluation of the applicant's complete file which consists of all official academic transcripts, undergraduate grade-point average, GRE scores (when required), three letters of reference regarding the applicant's ability to succeed in the Ph.D. degree in Systems Engineering, the applicant's statement of purpose, TOEFL or IELTS or iTEP or Pearson PTE Academic scores (for International applicants), applicant's work history, program enrollment and funding availability if required by applicant.

Admission may be granted by the Systems Engineering Program Director in special cases where a holistic evaluation shows that the applicant's credentials and work experience are appropriate.

Master Of Science In Systems Engineering (MS)

The program for the Master of Science in Systems Engineering (MSSE) focuses on holistic views of systems. As the complexity of everything increases, it is important for engineers to recognize that everything can be viewed as a system. The MSSE takes a total system lifecycle view – from cradle to grave. The program provides an ideal mix of theory and a practical experience-based approach to systems engineering. It is suitable for both working engineers looking for a broader view of engineering as well as for full-time students wishing to find out more about systems. Courses include the system lifecycle, project engineering, systems thinking and software systems engineering. At USA, we emphasize a model-based systems engineering approach (MBSE) in many of our courses. Graduates will have acquired the background needed to move into any industry that understands and values early concept development, the importance of solid systems requirements, systems integration, and verification and validation. Program admission and MS degree requirements, as well as plan of study options (thesis, project, and coursework only), are described under the College of Engineering section of this Bulletin. Most graduate courses in Systems Engineering are offered in late afternoon or early evening, in a blended classroom/webcast format to accommodate remote and practicing engineers.

Requirements For Admission To MSSE Program

The following requirements are additional to the admission criteria for the College of Engineering (see Admission to Graduate Programs):

Regular Admission

1. A grade-point average of 3.0 or greater (on a scale of 4.0) on all undergraduate coursework.
2. A minimum score of 146 in the Verbal portion and a minimum score of 151 in the Quantitative portion of the Graduate Record Examination (GRE) (see further details below).
3. For international students whose native language is not English, a minimum score of 79 on the Internet-based TOEFL, or a minimum score of 213 on the computer-based TOEFL, or a minimum score of band 6.5 on the IELTS test, or a minimum overall score of 58 on the Pearson PTE Academic Test.

Provisional Admission

1. A minimum grade-point average of 2.5 or greater (on a scale of 4.0) on all undergraduate coursework.
2. A minimum score of 138 in the Verbal portion and a minimum score of 141 in the Quantitative portion of the Graduate Record Examination (GRE) (see further details below).
3. For international students whose native language is not English, a minimum score of 79 on the Internet-based TOEFL, or a minimum score of 213 on the computer-based TOEFL, or a minimum score of band 6.5 on the IELTS test, or a minimum overall score of 58 on the Pearson PTE Academic Test.

Applicants for the MSSE program must submit officially certified scores on the Graduate Record Exam (GRE). This requirement is waived for students who received an engineering BS degree from the University of South Alabama. (Those students may be required, however, to present GRE scores to be eligible for some assistantships or fellowships.) Applicants holding a current P.E. license, or holding a Bachelor's degree in an engineering discipline (e.g. civil, computer, chemical, electrical, industrial, or mechanical engineering), or a minimum of five years of engineering work experience, may request that the GRE requirement be waived.

Final admission decisions are made based upon an evaluation of the applicant's complete file which consists of all official academic transcripts, undergraduate grade-point average, GRE scores (when required), and TOEFL or IELTS or iTEP or Pearson PTE Academic score (for International applicants), applicant's work history, program enrollment and funding availability if required by applicant.

Admission may be granted by the Systems Engineering Program Director in special cases where a holistic evaluation shows that the applicant's credentials and work experience are appropriate.