

# Systems Engineering (MS)

## Degree Requirements

### Requirements For Systems Engineering (MS) - 30 Credit Hours

All MSSE students are required to pass a Comprehensive Examination. Students completing the thesis options will provide an oral presentation of their work (i.e. thesis defense) which will count as the Comprehensive Examination.

#### Core Courses For All MSSE Options (6 Courses, 18 Hours Plus 1 Option)

- SE 500: Engineering Probability & Statistics
- SE 601: Systems Engineering Fundamentals
- SE 602: Risk and Failure Analysis
- SE 603: Integration, Test & Evaluation
- SE 604: Software Systems Engineering
- SE 606: Systems Architecture

Master of Science students in Systems Engineering must complete the core courses listed plus one (1) of the options as outlined:

- [Option 1: Thesis Option](#)
- [Option 2: Course Only Option](#)
- [Option 3: Project Option](#)

#### Option 1: Thesis Option (30 Hours)

This is a traditional 6-credit Master's Thesis.

Requirements	Hours
Major Courses credit hours required	18
Minor credit hours required	N/A
Institutional General Education or Core Curriculum hours required	N/A
Support Courses credit hours required	N/A
Required or Free Electives credit hours required	6
Thesis or Dissertation credit hours required	6
<b>Total credit hours required for completion</b>	<b>30</b>

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#### Option 2: Project Option (30 Hours)

This reflects the option of the student working on a project related to their employer's discipline and interest.

Requirements	Hours
Major Courses credit hours required	18
Minor credit hours required	N/A
Institutional General Education or Core Curriculum hours required	N/A

Support Courses credit hours required	N/A
Required or Free Electives credit hours required	9
Project credit hours required	3
<b>Total credit hours required for completion</b>	<b>30</b>

All MSSE students are required to pass a Comprehensive Examination. Students completing the thesis options will provide an oral presentation of their work (i.e. thesis defense) which will count as the Comprehensive Examination.

### Option 3: Course Only Option (30 Hours)

This allows a student to take 10 courses, pass the comprehensive exam and graduate.

Requirements	Hours
Major Courses credit hours required	18
Minor credit hours required	N/A
Institutional General Education or Core Curriculum hours required	N/A
Support Courses credit hours required	N/A
Required or Free Electives credit hours required	12
<b>Total credit hours required for completion</b>	<b>30</b>

All MSSE students are required to pass a Comprehensive Examination. Students completing the thesis options will provide an oral presentation of their work (i.e. thesis defense) which will count as the Comprehensive Examination.

## Department Information

Department of Systems Engineering Staff	(251) 460-7993
Chair	Dr. Robert Cloutier
Assistant Professor	Dr. Henry D. Lester
Assistant Professor	Dr. Sean Walker
Part-Time Instructor	Dr. Kari Lippert
Part-Time Instructor	Dr. Karen Cassidy

Department of Systems Engineering 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 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.” 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 the applicant's professional goals and commitment to completing the degree requirements through the applicant's Statement of Purpose.
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, 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. 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). Applicant's having a current P.E. license, or has an M.S. degree in a discipline related to engineering (e.g. civil, computer, chemical, electrical, industrial, mechanical engineering), may request that the GRE requirement is waived.
7. For international students whose native language is not English, a minimum score of 79 on the Internet-based TOEFL, a minimum score of 213 on the computer-based TOEFL, or a minimum score of band 6.5 on the IELTS test is required.
8. Transcripts from all colleges and universities attended by the applicant.

### **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.). (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. 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).
6. For international students whose native language is not English, a minimum score of 79 on the Internet-based TOEFL, a minimum score of 213 on the computer-based TOEFL, or a minimum score of band 6.5 on the IELTS test.

### **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. 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 work.
2. A minimum score of 151 on the GRE quantitative section and a minimum score of 146 on the GRE verbal section.

3. For students whose native language is not English, a minimum score of 79 on the internet-based TOEFL or a minimum IELTS band score of 6.5.

**Provisional Admission**

1. A minimum grade-point average of 2.5 on a scale of 4.0 on all undergraduate work.
2. A minimum score of 141 on the GRE quantitative section and a minimum score of 138 on the GRE verbal section required.
3. Three letters of recommendation from individuals familiar with the student's academic and technical abilities.
4. For students whose native language is not English, a minimum score of 79 on the internet-based TOEFL or a minimum IELTS band score of 6.5.

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 engineering work experience, may request that the GRE requirement be waived.