Student Handbook for

Master of Engineering in Systems Engineering

and

Master of Engineering in Engineering Management

2017-2018
Welcome to the Master of Engineering Programs in Systems Engineering and Engineering Management at Iowa State University! This student handbook will provide you with general guidelines regarding policies and procedures related to the programs. Please note that the Graduate College Handbook provides more detailed information on the graduate program policies. We advise you to review the Graduate College Handbook at http://www.grad-college.iastate.edu/common/handbook/.

The Master of Engineering degree programs in Systems Engineering and Engineering Management are managed through the Department of Industrial and Manufacturing Systems (IMSE) at Iowa State University (ISU). Information on the department and degree programs is located at:

http://www.imse.iastate.edu

Please review this handbook periodically for any updates. We look forward to working with you and wish you the best of success in your studies.

Systems Engineering and Engineering Management Graduate Programs Office
Iowa State University
3004 Black Engineering Building
Ames, Iowa 50011-2164
515.294.1682
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1. **INTRODUCTION**

1.1. **WHAT ARE **SYSTEMS ENGINEERING AND ENGINEERING MANAGEMENT?**

The systems we are designing today are more complex than ever. Engineers with specialized skills in systems engineering and/or engineering management are called on to help deal with the challenges of managing these complex systems.

The International Council of Systems Engineering (INCOSE) defines systems engineering as follows:

“Systems Engineering is an engineering discipline whose responsibility is creating and executing an interdisciplinary process to ensure that the customer and stakeholder's needs are satisfied in a high quality, trustworthy, cost efficient and schedule compliant manner throughout a system's entire life cycle.”

The American Society for Engineering Management (ASEM) defines engineering management as follows:

“Engineering Management (EM) bridges the gap between engineering and management. EM is the art and science of planning, organizing, allocating resources, and directing and controlling activities that have a technological component.”
1.2. **SYSTEMS ENGINEERING AND ENGINEERING MANAGEMENT PROGRAMS AT IOWA STATE UNIVERSITY**

The Master of Engineering in Systems Engineering Program and the Master of Engineering in Engineering Management Program are designed to enable engineers, regardless of undergraduate discipline, to develop the analytical abilities needed to design and manage complex systems. The intent of these programs is to extend the ability of engineers to work across disciplinary boundaries and to develop their management and leadership capabilities for today’s work environment.

Iowa State University offers several options in bringing these degree programs to you, so that you can fulfill your professional obligations and enhance your educational credentials. Delivery options include both on-line and on-campus courses.
2. Administration of Systems Engineering and Engineering Management Programs

The following individuals at ISU are available to assist you with any problems or questions you may have.

**Director of Graduate Education for Systems Engineering**

**Director of Graduate Education for Engineering Management**

Dave Sly, PE, Ph.D., MBA  
Department of Industrial and Manufacturing Systems Engineering  
3015 Black Engineering  
Iowa State University  
Ames, Iowa  50011  
Tel:  515-296-3120  
Fax:  515-294-3524  
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**Program Assistant**  
Department of Industrial and Manufacturing Systems Engineering  
3032 Black Engineering  
Iowa State University  
Ames, Iowa  50011  
Tel:  515-294-4702  
Fax:  515-294-3524  
Systems Engineering Email: systems-eng@iastate.edu  
Engineering Management Email: eng-management@iastate.edu
3. ADMISSION REQUIREMENTS

Unrestricted admission requires (1) a 3.0 grade point average from an ABET accredited undergraduate engineering program, (2) two years of engineering experience beyond completion of the undergraduate degree or current full-time employment as an engineer, (3) calculus, engineering statistics, and engineering economics. A GRE is not required for this program.

Applicants for admission to the Systems Engineering Program or the Engineering Management Program apply through the Graduate College at Iowa State University [http://www.admissions.iastate.edu/apply/](http://www.admissions.iastate.edu/apply/). Each applicant must submit:

- Application and application fee
- Official academic transcripts
- Three letters of recommendation
- Resume

Applications should be submitted as early as possible before the beginning of the semester for which admission is sought. Individuals may also take up to 9 credits at Iowa State as a non-degree seeking student and then transfer them to the program when they are admitted.

The Master of Engineering in Systems Engineering Program and the Master of Engineering in Engineering Management Program at Iowa State University are focused on supporting full time working professionals here in the United States and taking courses part-time through our distance education program. The program is not intended for full-time students taking courses in residence at Iowa State University. Teaching or research assistantships are not available.
4. Degree Requirements

Systems Engineering Program Coursework-Only Option

The complete requirements for the Systems Engineering program coursework-only option include the following:

Systems Engineering Program

Intro/Core (required first year)

- IE 563: Engineering & Systems Management  Fall
- IE 565: Systems Engineering and Analysis  Spring

Core (required)

- IE 564: Decision Analysis in System Design  Spring
- IE 570: Systems Engineering and Project Management  Spring
- IE 585: Requirements & Architecture Engineering  Alt. Spring (Odd)

Electives

Manufacturing Courses

- IE 448: Manufacturing Systems Engineering  Summer
- IE 561: Continuous Quality Improvement of Process  Alt. Fall (Even)
- IE 572: Design & Evaluation of Human-Computer Interaction  Spring
- IE 577: Human Factors  Fall
- IE 541: Inventory Control & Production Planning  Spring

Engineering Courses

- IE 452: Introduction to Systems Engineering  Summer/Fall
- IE 560: Engineering Risk Analysis  Alt. Fall (Odd)
- IE 581: E-Commerce Systems Engineering  Alt. Fall (Even)
- IE 582: Enterprise Modeling & Integration  Alt. Spring (Even)
- IE/AerE 568: Large-Scale Complex Engineered Systems  Fall
- IE 503: Introduction to Sustainable Production Systems  Alt. Spring (Odd)
- ME 525: Optimization Methods for Complex Designs  Spring
- AerE 563: Intro to Multidisciplinary Design Optimization  Spring
- AerE 554: Metaheuristic Optimization & Modelling for Complex System Design  Spring

Software Courses

- IE 581: e-Commerce Systems Engineering  Alt. Fall (Even)

1 Other from any graduate program (optional)

* Elective courses are subject to change by IMSE Department

The student’s major professor will be the Director of Graduate Education for Systems Engineering, and will also have responsibility for monitoring progress and providing guidance on coursework. The major professor approves each student’s program of study (POS).
**Systems Engineering Certificate Option**

The complete requirements for the Systems Engineering Certificate option include the following:

<table>
<thead>
<tr>
<th>Systems Engineering Certificate</th>
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</thead>
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**Intro/Core (required first year)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>IE 563</td>
<td>Engineering &amp; Systems Management</td>
<td>Fall</td>
</tr>
<tr>
<td>IE 565</td>
<td>Systems Engineering and Analysis</td>
<td>Spring</td>
</tr>
</tbody>
</table>

**Core (required to pick 2)**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>IE 564</td>
<td>Decision Analysis in System Design</td>
<td>Spring</td>
</tr>
<tr>
<td>IE 560</td>
<td>Engineering Risk Analysis</td>
<td>Alt. Fall (Odd)</td>
</tr>
<tr>
<td>IE 570</td>
<td>Systems Engineering and Project Management</td>
<td>Spring</td>
</tr>
<tr>
<td>IE 585</td>
<td>Requirements &amp; Architecture Engineering</td>
<td>Alt. Spring (Odd)</td>
</tr>
</tbody>
</table>

The student’s major professor will be the Director of Graduate Education for Systems Engineering Certificate Option, and will also have responsibility for monitoring progress and providing guidance on coursework. The major professor approves each student’s program of study (POS).
*Engineering Management Coursework-Only Option*

The complete requirements for the Engineering Management program coursework-only option include the following:

**Engineering Management Program**

**Intro/Core (required first year)**
- IE 563: Engineering & Systems Management  
  Fall
- IE 565: Systems Engineering and Analysis  
  Spring

**Core (required)**
- SCM 524: Strategic Process Analysis & Improvement  
  Fall
- IE 570: Systems Engineering and Project Management  
  Spring
- MGMT 583: Strategic Management of Innovation  
  Spring
- ACCT 581: Accounting for Decision Making  
  Spring

**Electives**

**Engineering Courses**
- IE 564: Decision Analysis in System Design  
  Spring
- IE 560: Engineering Risk Analysis  
  Alt. Fall (Odd)
- IE 561: Continuous Quality Improvement of Process  
  Alt. Fall (Even)
- IE 541: Inventory Control & Production Planning  
  Spring
- ConE 380: Engineering Law  
  Summer

**Business Courses**
  Spring (Even)
- MKT 501: Marketing  
  Fall (Even)
- MGMT 503: Professional Responsibility in Business & Society  
  Fall (Odd)

1 Other from any graduate program (optional)

* Elective courses are subject to change by IMSE Department

The student’s major professor will be the Director of Graduate Education for Engineering Management, and will also have responsibility for monitoring progress and providing guidance on coursework. The major professor approves each student’s program of study (POS).
5. **CHRONOLOGICAL LIST OF ITEMS THAT MUST BE COMPLETED TO OBTAIN THE DEGREE**

All forms noted below can be found on the Graduate College website at [http://www.grad-college.iastate.edu/common/forms/student_forms.php](http://www.grad-college.iastate.edu/common/forms/student_forms.php)

<table>
<thead>
<tr>
<th>Items</th>
<th>Completion Date</th>
<th>Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application for Graduate College</td>
<td>Before the completion of nine credit hours of coursework at ISU (non-degree seeking students)</td>
<td><a href="http://www.admissions.iastate.edu/apply/graduate.php">http://www.admissions.iastate.edu/apply/graduate.php</a></td>
</tr>
<tr>
<td>Satisfy Graduate English Requirement (for non-native speakers only, see details below)</td>
<td>Beginning of first semester of enrollment</td>
<td></td>
</tr>
<tr>
<td>Program of Study Approval</td>
<td>Before completing 12 credits of graduate work</td>
<td>&quot;Program of Study&quot; online form</td>
</tr>
<tr>
<td>Application for Graduation (Diploma Slip) Filed</td>
<td>Before the semester of graduation begins</td>
<td>&quot;Application for Graduation (Diploma Slip)&quot; online form</td>
</tr>
<tr>
<td>Request for Graduation Check/Approval</td>
<td>Before the semester of graduation begins</td>
<td>“Request for Graduation Check/Approval” form</td>
</tr>
</tbody>
</table>

**Fill out a draft copy of each form and email to the Program Assistant. We will review and return to student for signature.**
6. DESCRIPTION OF THE CHRONOLOGICAL LIST OF ITEMS THAT MUST BE COMPLETED TO OBTAIN THE DEGREE

6.1. COMPLETE APPLICATION FOR GRADUATE SCHOOL
You must be admitted to the Graduate College before you complete more than nine hours of coursework at ISU. That is, if you are taking courses as a non-degree (undeclared) student, do not take more than nine credits at ISU before you formally apply to the Systems Engineering program. Only nine credits taken before admission may be applied to the total number of credits required for graduation.

You may apply online at http://www.admissions.iastate.edu/apply/.

6.2. SATISFY GRADUATE ENGLISH REQUIREMENT, IF APPLICABLE
Non-native speakers or international students who do not have undergraduate degrees from U.S. universities must take the English placement test at the beginning of their first semester of enrollment. Students who do not pass the exam will be assigned to take one or more English courses. Please refer to the following link for additional details: http://www.grad-college.iastate.edu/common/handbook/

For more information on dates and locations of the exams, please contact the following:

TESL/Applied Linguistics
226 Ross Hall
Ames, IA  50011
Phone:  515-294-6398
Email:  ept@iastate.edu

6.3. APPROVAL OF PROGRAM OF STUDY (POS)
- Accomplish during the first semester of admission and absolutely before completing 12 credits of graduate work. If necessary, changes may be made to the POS at a later date by completing the “Modifications to the POS” form on Access Plus.

- List all courses applicable to the program.

- The Director of Graduate Education for Systems Engineering and Engineering Management will assist you with development of your POS.
6.4. Diploma Slip
Completed and submitted before the semester of graduation begins.

6.5. Request for Graduation Check/Approval List
Completed before the semester of graduation begins.

6.6. Graduate College Handbook
For detailed information regarding the items described above, please consult the “Graduate Handbook.” The handbook describes Graduate College guidelines and procedures. It is a valuable reference for ISU students. You can also access the latest version of the handbook on the WEB at http://www.grad-college.iastate.edu/common/handbook/.
7. COURSES

7.1. SCHEDULE OF COURSES
A schedule of courses provided for each semester can be found on the Engineering-LAS Online Learning webpage at http://www.elo.iastate.edu/

Tentative course rotations can be found online at http://www.elo.iastate.edu/tentative-course-rotations/

7.2. REGISTERING FOR COURSES
There are several options to register for courses. The student can register online through the following website https://accessplus.iastate.edu/NonAuth/R404/R4048.jsp.

7.3. TRANSFER COURSES
You may not transfer more than nine hours of coursework to be applied to your program of study if those courses were taken at ISU, and no more than eight hours from another accredited institution. In other words, at least twenty-two credits must be taken at ISU. The certificate program does not allow for transfer credits from outside ISU. You must receive a “B” or better on any transfer course. It is advisable to get the course approved with your major professor before you take the course. Provide a description of the course numbering system (in order for ISU to confirm that the course is a graduate level course) or some other type of evidence that the institution at which you took the course considers it to be a graduate course. Also provide a copy of the course syllabus, a catalog description of the course, the name of textbook(s) used for the course, and the name and telephone number of the course instructor.

7.4. TEXTBOOKS
Textbook information is available from

University Book Store
Phone: 1-800-478-0048
On-line: http://www.isubookstore.com/

7.5. TUITION AND FEES
Tuition and fees are subject to change. The latest updated information can be found on the Engineering-LAS Online Learning Web page at http://www.elo.iastate.edu/how-elo-works/tuition-and-fees/.
8. **Important Telephone Numbers and Links**

<table>
<thead>
<tr>
<th>What</th>
<th>Telephone</th>
<th>Website</th>
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<tbody>
<tr>
<td></td>
<td>or 515-294-5684</td>
<td></td>
</tr>
<tr>
<td>College of Engineering</td>
<td></td>
<td><a href="http://www.engineering.iastate.edu/">http://www.engineering.iastate.edu/</a></td>
</tr>
<tr>
<td>Engineering-LAS Online Learning</td>
<td>1-800-854-1675 or 515-294-7470</td>
<td><a href="http://www.elo.iastate.edu/">http://www.elo.iastate.edu/</a></td>
</tr>
<tr>
<td>Graduate Admissions</td>
<td>515-294-0818</td>
<td></td>
</tr>
<tr>
<td>Graduate College</td>
<td>515-294-4531</td>
<td><a href="http://www.grad-college.iastate.edu/">http://www.grad-college.iastate.edu/</a></td>
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