Master of Engineering Programs

in

Systems Engineering and

Engineering Management

Student Handbook
2015-2016

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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Student Handbook

for

Master of Engineering in Systems Engineering

and Engineering Management Programs

1. INTRODUCTION

1.1. WHAT IS SYSTEMS ENGINEERING AND ENGINEERING MANAGEMENT?

The systems we are designing today are more complex than ever. Engineers with specialized skills in systems engineering and 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 and Engineering Management programs 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 PROGRAM

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

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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 apply through the Graduate College at Iowa State University 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 and Engineering Management Program at Iowa State University is 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:

1. **Systems Engineering Intro/Core Courses (required first year)**

   IE 563. Engineering Management Theory (Fall)
   IE 565. Systems Engineering & Analysis (Spring)

2. **Core (required)**

   IE 564. Decision Analysis in System Design (Spring)
   IE 570. Systems Engineering & Project Management (Fall)
   IE 585. Requirements Engineering (Odd Springs)

5. **Online Electives* (Select 5 courses/15 credits) – note, additional on-campus courses may also apply (contact the DOGE if that is an option for you)**

   Manufacturing Courses
   >   IE 448. Manufacturing Systems Engineering (Summer)
   >   IE 541. Inventory Control & Production Planning (Even Springs)
   >   IE 549. Computer Aided Design & Manufacturing (Odd Falls)
   >   IE 561. Continuous Quality Improvement of Process (Even Falls)
   >   IE 572. Design & Evaluation of Human Computer Interaction (Spring)
   >   IE 577. Human Factors (Fall)

   Engineering Courses

   >   IE 582. Agent Based Modeling and Simulation (Even Springs)
   >   IE 503. Introduction to Sustainable Production Systems (Odd Springs)
   >   IE 560. Engineering Risk Analysis (Odd Falls)
   >   IE/Aer E 568. Large-Scale Complex Engineered Systems (Spring)
   >   ME 525. Optimization Methods for Complex Designs (Spring)
   >   Aer E 563. Multidisciplinary Design Optimization (Spring)

   Software Courses

   >   IE 581. e-Commerce Systems Engineering (Even Falls)

   1 Optional Course (must be ISU Graduate Level course)

* 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:

1. **Systems Engineering Intro/Core Courses (required first year)**

   IE 563. Engineering Management Theory
   IE 565. Systems Engineering & Analysis

2. **Core (required to select 2 courses)**

   IE 560. Engineering Risk Analysis
   IE 564. Decision Analysis in System Design
   IE 570. Systems Engineering & Project Management
   IE 585. Requirements Engineering

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:

1. **Engineering Management Intro/Core Courses (required first year)**

   IE 563. Engineering Management Theory (Fall)
   IE 565. Systems Engineering & Analysis (Spring)

2. **Core (required)**

   IE 570. Systems Engineering & Project Management (Spring)
   MGMT 583. Strategic Management of Innovation (Fall)
   SCM 524. Strategic Process Analysis & Improvement (Spring)

3. **Electives* (Select 5 courses/15 credits) – note, additional on-campus courses may also apply (contact the DOGE if that is an option for you)**

   Engineering Courses

   IE 541. Inventory Control & Production Planning (Even Springs)
   IE 561. Continuous Quality Improvement of Process (Even Falls)
   IE 560. Engineering Risk Analysis (Odd Falls)
   IE 564. Decision Analysis in System Design (Spring)
   Con E 380. Engineering Law (Summer)

   Business Courses

   FIN 501. Financial Valuation & Corporate Financial Decisions (Spring)
   MGMT 503. Professional Responsibility in Business & Society (Fall)
   MKT 501. Marketing (Spring)

   1 Optional Course (must be ISU Graduate Level course)

* 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

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

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

What	*Telephone*	*Website*
University Bookstore	1-800-433-3451, or 515-294-5684	http://www.isubookstore.com/
College of Engineering		http://www.engineering.iastate.edu/
Engineering-LAS Online Learning	1-800-854-1675 or 515-294-7470	http://www.elo.iastate.edu/
Graduate Admissions	515-294-0818	
Graduate College	515-294-4531	http://www.grad-college.iastate.edu/