Graduate Programs
Master’s Degrees

Industrial Engineering and
Management Systems

August 16, 2013

Ahmad Elshennawy
Associate Chair and Graduate Program Coordinator
Graduate Degrees: Prior to 2013 – 14
Academic Catalog

MSIE - - BSIE Required

MSIE - - Other Engineering Degrees ONLY

Master of Science in Engineering Management (MSEM)

Master of Science (MS)

Ph.D. in Industrial Engineering

MS Focus Areas
- Human Systems Engineering / Ergonomics
- Systems Operations and Modeling
- Quality Systems Engineering
- Interactive Simulation and Training Systems
- Systems Engineering
Graduate Degrees

- Master of Science in Engineering Management (MSIE)
- Master of Science in Engineering Management (MSEM)
- Master of Science (MS)
- Ph.D. in Industrial Engineering
Graduate Degrees

Course Offering Areas

- Human Systems Engineering / Ergonomics
- Systems Operations and Modeling
- Quality Systems Engineering
- Interactive Simulation and Training Systems
- Systems Engineering
Human Systems Engineering/Ergonomics Courses

- EIN 5248C Ergonomics (3 credit hours)
- EIN 5251 Usability Engineering (3 credit hours)
- EIN 6270C Work Physiology (3 credit hours)
- EIN 6258 Human-Computer Interaction (3 credit hours)
- EIN 6279C Biomechanics (3 credit hours)
- EIN 6935 Advanced Ergonomics Topics (3 credit hours)
- EIN 6271 Human Reliability (3 credit hours)
Quality and Production Systems Courses

- ESI 6225 Quality Design and Control (3 credit hours)
- ESI 6224 Quality Management (3 credit hours)
- EIN 5392C Manufacturing Systems Engineering (3 credit hours)
- EIN 5388 Forecasting (3 credit hours)
- EIN 6336 Production and Inventory Control (3 credit hours)
- EIN 6425 Scheduling and Sequencing (3 credit hours)
- EIN 5356 Cost Engineering (3 credit hours)
- ESI 5227 Total Quality Improvement (3 credit hours)
- ESI 6247 Experimental Design and Taguchi Methods (3 credit hours)
Management Systems Courses

- EIN 6182 Engineering Management (3 credit hours)
- EIN 5117 Management Information Systems I (3 credit hours)
- EIN 6370 Innovation in Engineering Design (3 credit hours)
- EIN 6339 Operations Engineering (3 credit hours)
- EIN 5108 The Environment of Technical Organizations (3 credit hours)
Simulation, Optimization and Modeling Courses

- ESI 6336 Queuing Systems (3 credit hours)
- ESI 5306 Operations Research (3 credit hours)
- ESI 6418 Linear Programming and Extensions (3 credit hours)
- ESI 6532 Object-Oriented Simulation (3 credit hours)
- ESI 5531 Discrete Systems Simulation (3 credit hours)
- EIN 5255C Interactive Simulation (3 credit hours)
- EIN 6528 Simulation Based Life Cycle Engineering (3 credit hours)
- EIN 6645 Real-Time Simulation Agents (3 credit hours)
- EIN 6936 Seminar in Advanced Industrial Engineering (3 credit hours)
- ESI 5419C Engineering Applications of Linear and Nonlinear Optimization (3 credit hours)
- ESI 6217 Statistical Aspects of Digital Simulation (3 credit hours)
- ESI 6529 Advanced Systems Simulation (3 credit hours)
- ESI 6921 Seminar in Advanced Operations Research (3 credit hours)
Systems Engineering Courses

- ESI 6358 Decision Analysis (3 credit hours)
- ESI 5359 Risk Assessment and Management (3 credit hours)
- EIN 6215 System Safety Engineering and Management (3 credit hours)
- ESI 5236 Reliability Engineering (3 credit hours)
- EIN 5346 Engineering Logistics (3 credit hours)
- ESI 6891 IEMS Research Methods (3 credit hours)
Master of Science in Industrial Engineering (MSIE)
Degree Details

MSIE

Prerequisite

Required Courses

Elective Courses
All applicants are expected to have undergraduate degrees in industrial engineering or other engineering degrees and have completed the following prerequisites during their undergraduate engineering education:

- Mathematics through Calculus II (MAC 2312 or equivalent)
- An undergraduate course in engineering probability and statistics
- Familiarity of at least one programming language (such as C, FORTRAN, Java, Visual BASIC, C++, etc.)
- Familiarity of common computer skills and tools such as word processors and spreadsheets
Degree Details

MSIE

Prerequisites

Required Courses - 12 Credit Hours

• ESI 5219 Engineering Statistics (3 credit hours)
• EIN 5140 Project Engineering (3 credit hours)
• ESI 6551C Systems Engineering (3 credit hours)
• EIN 6357 Advanced Engineering Economic Analysis (3 credit hours)
Degree Details

MSIE

Prerequisites

Required Courses

Elective Courses

Elective Courses - - 18 Credit Hours

Thesis Option:
- EIN 6971 (6 credit hours)
- Electives (12 credit hours)

Non-Thesis Option:
- Electives (18 credit hours)
MSIE Admission Requirements

In addition to the general UCF graduate application requirements, applicants to this program must provide:

- One official transcript (in a sealed envelope) from each college/university attended.
- A bachelor’s degree in Industrial Engineering or a related discipline.
- Two letters of recommendation.
- Résumé.
- Statement of educational, research, and professional career objectives.
- Applicants applying to this program who have attended a college/university outside the United States must provide a course-by-course credential evaluation with GPA calculation. Credential evaluations are accepted from World Education Services (WES) or Josef Silny and Associates, Inc. only.
Master of Science (MS)
Degree Details

MS

Prerequisite

Required Courses

Elective Courses
The MS program requires an undergraduate degree in engineering, mathematics, computer science, statistics, physics, quantitative management or similar field. Regardless of the undergraduate degree, all applicants must have completed the following prerequisites:

- Mathematics through Calculus II (MAC 2312 or equivalent)
- An undergraduate course in engineering probability and statistics.
- In addition, they are expected to be familiar with at least one programming language (such as C, FORTRAN, Java, Visual BASIC, C++, etc.) and common computer skills and tools such as word processors and spreadsheets.
Degree Details

**MS**

**Prerequisites**

**Required Courses**

- ESI 5219 Engineering Statistics (3 credit hours)
- EIN 5140 Project Engineering (3 credit hours)
- ESI 6551C Systems Engineering (3 credit hours)
- EIN 6357 Advanced Engineering Economic Analysis (3 credit hours)

**Elective Courses**
Elective Courses - - 18 Credit Hours

Thesis Option:
• EIN 6971 (6 credit hours)
• Electives (12 credit hours)

Non-Thesis Option:
• Electives (18 credit hours)
MS Admission Requirements

In addition to the general UCF graduate application requirements, applicants to this program must provide:

- One official transcript (in a sealed envelope) from each college/university attended.
- A bachelor’s degree in Industrial Engineering or a related discipline.
- Two letters of recommendation.
- Résumé.
- Statement of educational, research, and professional career objectives.
- Applicants applying to this program who have attended a college/university outside the United States must provide a course-by-course credential evaluation with GPA calculation. Credential evaluations are accepted from World Education Services (WES) or Josef Silny and Associates, Inc. only.
Master of Science in Engineering Management (MSEM)
MSEM Degree Details

MSEM

Prerequisites

Core Courses
Four courses

Focus Courses
Three courses

Electives
Three courses

30 credit hours
MSEM Degree Details

Pre-Requisites

- Mathematics through Calculus II (MAP 2312)
MSEM Degree Details

Required Courses - 12 Credit Hours

- ESI 5219 Engineering Statistics (3 credit hours)
- EIN 5140 Project Engineering (3 credit hours)
- ESI 6551C Systems Engineering (3 credit hours)
- EIN 6357 Advanced Engineering Economic Analysis (3 credit hours)
Required Courses - - 9 Credit Hours

- EIN 5108 The Environment of Technical Organizations (3 credit hours)
- EIN 6370 Innovation in Engineering Design (3 credit hours)
- EIN 6182 Engineering Management (3 credit hours)
MSEM Degree Details

Elective Courses - - 9 Credit Hours

Thesis Option:
• EIN 6971 (6 credit hours)
• Electives (3 credit hours)

Non-Thesis Option:
• Electives (9 credit hours)
MSEM Admission Requirements

In addition to the general UCF graduate application requirements, applicants to this program must provide:

- One official transcript (in a sealed envelope) from each college/university attended.
- A bachelor’s degree in Industrial Engineering or a related discipline.
- Two letters of recommendation.
- Résumé.
- Statement of educational, research, and professional career objectives.
- Applicants applying to this program who have attended a college/university outside the United States must provide a course-by-course credential evaluation with GPA calculation. Credential evaluations are accepted from World Education Services (WES) or Josef Silny and Associates, Inc. only.
Program Requirements

- MSIE, MSEM, or MS - 24 hours plus 6 hour thesis or 30 hours with no thesis
- At least 15 hours of 6000-level courses
- Transfer credit: B- or above, 9 hour maximum
Programs of study

- A first draft of your POS must be completed this semester.
  - You may be denied registration for subsequent semesters if you do not file a POS in a timely manner.
  - This is a good activity for mid-late September.

- Your POS can be changed and updated when appropriate – as many times as necessary.

- Your POS is not firm until you graduate.
Choices

- Non-thesis or thesis option?
  - Make the decision as early as possible.
  - If interested, find a thesis advisor and a thesis topic as soon as possible.

- Change track?

- Read your email from Graduate Studies, IEMS!

- Update your contact information on MyUCF!
Academic Progress

- Meet or exceed the instructor’s expectations in every class
- Incomplete grades are to be avoided
- Withdrawals can affect your support and/or immigration status
- 7 years to complete your degree
- Probation (GPA < 3.0)
- Dismissal (do not meet conditions of probation)
Program of Study

- Identify transfer credits (if any)
- Identify substitution for required courses (if any)
- Selection of electives - - Approved by Graduate Director
  - Any IEMS course
  - ME, CS, Math, Stat, Psychology, Business
  - Courses appropriate for area of study
Transfer of Credits

- The total number of transfer credits may not exceed 50% of program requirements, except under two circumstances.

  - UCF graduate certificate credits: up to all of the hours taken to fulfill an earned UCF graduate certificate can be used toward a graduate degree within the same or closely related discipline.

Types of Credit Transfer:

- External Transfer Credits
- Internal Transfer Credits
External Transfer Credits

- External transfer credits: graduate-level course credits completed at a regionally accredited institution (excluding UCF) or recognized international institution.

- External credits are eligible for transfer only if they meet the following criteria:
  - Only graduate-level or higher courses may be accepted as transfer credits.
  - Only courses with a grade of "B-" or higher are allowed to be transferred into a program of study
  - Only hours that are no more than seven years old at the time the degree is conferred may be transferred, unless part of an earned graduate or professional degree
  - Only formal course work hours, but not thesis or research hours, may be used as transfer credits
  - Limited to up to 9 hours
Internal Transfer Credits

• Internal transfer credits: graduate-level course credits completed
  • at UCF prior to enrolling in the program for which the degree is sought, including those taken in undergraduate status at UCF as part of a Senior Scholar or accelerated program; or
  • as a Traveling Scholar (see Traveling Scholars in the General Graduate Policies for more information).

• Internal credits are eligible for transfer only if they meet the following criteria:
  • Only graduate-level courses may be accepted as transfer credits.
  • Only courses with a grade of "B-" or higher are allowed to be transferred into a program of study
  • Only hours that are no more than seven years old at the time the degree is conferred may be transferred, unless part of an earned graduate degree.
# Summary of Transfer Credits

<table>
<thead>
<tr>
<th>Student Situation</th>
<th>Specific Requirements</th>
<th>General Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transfer credits from an earned graduate degree</td>
<td>≤ 9 SCH</td>
<td></td>
</tr>
<tr>
<td>External credits</td>
<td>≤ 9 SCH</td>
<td>Sum may not exceed 9 SCH</td>
</tr>
<tr>
<td>Graduate-level credits while in UCF undergraduate status</td>
<td>≤ 9 SCH</td>
<td></td>
</tr>
<tr>
<td>Other internal transfer credits</td>
<td></td>
<td>Total transfer credits may not exceed 50% of program requirements*</td>
</tr>
</tbody>
</table>

*Exceptions:
- May exceed 50% only if all transfer credits are from a single earned UCF graduate certificate; no additional credits may be transferred.
- Transfer of credits from a UCF doctoral program to a master’s program within the same discipline.
Graduation Requirements

- Must be registered in term of graduation
- Submit Intent to Graduate form at time of registration
- Overall GPA $\geq 3.0$ in Program of Study
- At least 15 hours of 6000-level courses
- No more than 9 hours of post-baccalaureate or transfer courses
- No unresolved I grades in Program of Study
- All courses within past 7 years
Graduation Requirements (cont.)

- Thesis students
  - Defense and written thesis to editor/library by specified deadlines

- Non-thesis students
  - Oral Comprehensive Examination
    - To determine if student has a grasp of fundamental concepts in area of study
    - 10th-12th week of last semester
    - “Big picture”

- Final Program of Study and Audit
Comprehensive examinations

- Non-thesis students who are not following either the Engineering Management Track or Interactive Simulation Track must pass a comprehensive examination in their last semester.

- Typically, the comprehensive exam consists of:
  - A case study assigned by a faculty committee.
  - Presentation on the case by the student.
  - Committee questions the student about the case, etc.
Your Responsibilities

- It is your responsibility to keep informed of all rules, policies and procedures, and other requirements related to your graduate program
- File a timely program of study
- Observe and Meet all deadlines!
- File an on-line Intent to Graduate or a certificate completion form
- Complete Exit Surveys
Certificate Programs
• Applied Operations Research Graduate Certificate
• Design for Usability Graduate Certificate
• Industrial Ergonomics and Safety Graduate Certificate
• Project Engineering Graduate Certificate
• Quality Assurance Graduate Certificate
• Systems Engineering Graduate Certificate
• Systems Simulation for Engineers Graduate Certificate
• Training Simulation Graduate Certificate
Applied Operations Research Graduate Certificate

- **Required Courses—9 Credit Hours**
  - ESI 5219 Engineering Statistics (3 credit hours)
  - ESI 5306 Operations Research (3 credit hours)
  - ESI 5531 Discrete Systems Simulation (3 credit hours)

- **Elective Course—3 Credit Hours**
  - Choose one of the following three courses.
    - ESI 6336 Queuing Systems (3 credit hours)
    - ESI 6358 Decision Analysis (3 credit hours)
    - ESI 6418 Linear Programming and Extensions (3 credit hours)
Design for Usability Graduate Certificate

- **Required Courses—12 Credit Hours**
  - EIN 5248C Ergonomics (3 credit hours)
  - EIN 5251 Usability Engineering (3 credit hours)
  - EIN 6258 Human Computer Interaction (3 credit hours)
  - ESI 6247 Experimental Design and Taguchi Methods (3 credit hours)
Industrial Ergonomics and Safety Graduate Certificate

- Required Courses—6 Credit Hours
  - EIN 5248C Ergonomics (3 credit hours)
  - EIN 6215 System Safety Engineering and Management (3 credit hours)

- Elective Courses – 6 Credit Hours
  Choose two of the following courses:
  - EIN 6279C Biomechanics (3 credit hours)
  - EIN 6264C Industrial Hygiene (3 credit hours)
  - EIN 6270C Work Physiology (3 credit hours)
Project Engineering Graduate Certificate

- **Required Courses—9 Credit Hours**
  - EIN 5108 The Environment of Technical Organizations (3 credit hours)
  - EIN 5117 Management Information Systems I (3 credit hours)
  - EIN 5140 Project Engineering (3 credit hours)

- **Elective Course—3 Credit Hours**
  - Choose one of the following two courses.
    - EIN 6357 Advanced Engineering Economic Analysis (3 credit hours)
    - ESI 6358 Decision Analysis (3 credit hours)
Quality Assurance Graduate Certificate

- **Required Courses—9 Credit Hours**
  - ESI 5219 Engineering Statistics (3 credit hours)
  - ESI 5236 Reliability Engineering (3 credit hours)
  - ESI 6225 Quality Design and Control (3 credit hours)

- **Elective Course—3 Credit Hours**
  Choose one of the following two courses.
  - ESI 5227 Total Quality Improvement (3 credit hours)
  - ESI 6224 Quality Management (3 credit hours)
Systems Engineering Graduate Certificate

- Required Courses—12 Credit Hours
  - ESI 5219 Engineering Statistics (3 credit hours)
  - ESI 5306 Operations Research (3 credit hours)
  - ESI 5531 Discrete Systems Simulation (3 credit hours)
  - ESI 6551C Systems Engineering (3 credit hours)
Systems Simulation for Engineers Graduate Certificate

- Required Courses—12 Credit Hours
  - ESI 5219 Engineering Statistics (3 credit hours)
  - ESI 5531 Discrete Systems Simulation (3 credit hours)
  - ESI 6217 Statistical Aspects of Digital Simulation
  - ESI 6532 Object-oriented Simulation (3 credit hours)
Training Simulation Graduate Certificate

- **Required Courses—12 Credit Hours**
  - EIN 5255C Interactive Simulation (3 credit hours)
  - EIN 5317 Training System Design (3 credit hours)
  - EIN 6645 Real-Time Simulation Agents (3 credit hours)
  - EIN 6649C Intelligent Tutoring Training System Design (3 credit hours)
Our objective is YOUR SUCCESS!

We are here to help YOU!
Questions?

Graduate Coordinator - -
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IEMS Graduate Office

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