Problem solving in Industrial and Systems Engineering entails recognizing and identifying decision problems, as well as generating, evaluating, choosing, and implementing solutions to them. Much of Industrial Engineering involves making and implementing decisions as efficiently and effectively as possible. The MS degree in DS/OR seeks to train students in the methodology used in decision science and operations research, in order to prepare them for careers in government and industry.

STUDY PLAN

Before you register for classes, you must meet with your advisor to develop a study plan listing the specific courses that you plan to take to earn your MSIE. This plan must satisfy the curriculum requirement listed below, and it must be approved by your advisor. You can deviate from this plan only if the changes are approved by your advisor in advance.

MS DEGREE REQUIREMENTS

The curriculum is designed to provide both balance and breadth in the student's understanding of decision science and operations research techniques and applications. To accomplish this, students must take a specified number of classes in each of several core areas. The program is rounded out with electives. Flexibility is built into the curriculum to accommodate a wide range of interests and applications.

Please note that for any cross-listed courses, you can enroll through any department. You are not required to enroll through ISyE to receive credit.

MS DEGREE REQUIREMENTS (30 CREDITS TOTAL)

All students need to have 30 credits with the following sub-requirements: 12 credits from broad core courses; 6 credits from track-specific core courses; and the rest from technical electives. Maximum 6 credits of independent study may be used. Please note if you earn a grade of C or below in a course you CANNOT count that course toward the 30-credit requirement.

BROAD CORE COURSES (12 credits)

Select one course from each:

1. Optimization
   - ISyE 525: Linear Programming Methods
   - ISyE 524: Introduction to Optimization

2. Probability and Stochastic Modeling
   - ISyE 624: Stochastic Modeling Technique
   - ISyE 632: Introduction to Stochastic Modeling
   - ISyE 643: Performance Analysis of Manufacturing Systems

3. Simulation
   - ISyE 620: Simulation Modeling and Analysis

4. Statistics and Decision Analysis
   - ISyE 412: Fundamentals of Industrial Data Analytics
   - ISyE 512: Inspection, Quality Control, and Reliability
   - ISyE 516: Introduction to Decision Analysis
   - ISyE 575*: Introduction to Quality Engineering
   - Stat 424*: Statistical Experimental Design for Engineers

*Only one of ISyE 575 and Stat 424 may count toward the MS degree.

The Associate Chair of Graduate Affairs is responsible for evaluating equivalencies.
**MS DEGREE REQUIREMENTS Continued**

**TRACK CORE COURSES (6 credits)**
Select two courses from:
- ISyE 517: Decision Making in Health Care
- ISyE 633: Queuing Theory and Stochastic Modeling
- ISyE 719: Stochastic Programming
- ISyE 728: Integer Optimization
- ISyE 723: Dynamic Programming and Associate Topics
- ISyE 726: Nonlinear Programming Theory and Applications
- ISyE 727: Convex Analysis
- ISyE 730: Nonlinear Programming Algorithms
- ISyE 425: Intro to Combinatorial Optimization

Additional courses taken from the list of BROAD CORE courses may be used to fulfill TRACK CORE course requirements.

**TECHNICAL ELECTIVES (12 credits)**
Six credits must be ISyE courses or cross-listed with ISyE

These courses are chosen to meet your interests and career goals. **Remember that your advisor must approve these courses in advance.** Courses need to be at the 400 level or above.

Sample electives:
- Any of the courses listed above are acceptable as electives, provided that they are not used to fulfill other requirements.
- Any other courses in ISyE such as:
  - ISyE 415: Introduction to Manufacturing Systems, Design and Analysis
  - ISyE 449: Sociotechnical Systems in Industry
  - ISyE 515: Engineering Management of Continuous Process Improvement
  - ISyE 612: Information Sensing and Analysis for Manufacturing Processes
  - ISyE 641: Design and Analysis of Manufacturing Systems
  - ISyE 658: Managing Technological Change in Manufacturing Systems
  - ISyE 671: E-Business: Technologies, Strategies and Applications
- Any courses 400 level or above in Engineering Mathematics, Statistics, Business, Computer Sciences, Economics, Population Health Sciences, or Psychology if it is approved by your advisor.

**EXIT REQUIREMENTS**

In order to be eligible for graduation, a Master’s student must:
- Have a GPA of 3.0 or above
- Meet all MS degree requirements for their focus area
- Have all grades entered, except for the current semester. No I’s or NRs can show on the student’s transcript.
- Be enrolled in at least 2 cr the semester in which they graduate.
- Have their MS degree warrant signed and dated by the degree deadline.

**LABORATORIES & CENTERS**
- Large System Advanced Planning and Scheduling Laboratory
- Operations Research Laboratory
- Stochastic Systems Laboratory

**JOB PLACEMENT**

Engineering Career Services Office
1550 Engineering Drive, Room M1002
Madison, WI 53706
Tel: (608) 262-3471
FAX: (608) 262-7262
http://www.engr.wisc.edu/services

**FURTHER INFORMATION**

University of Wisconsin-Madison
ISyE Graduate Student Services
3182 Mechanical Engineering
1513 University Avenue
Madison, WI 53706
Tel: (608) 263-4025
Fax: (608) 890-2204
Email: coegradadmission@wisc.edu
http://www.engr.wisc.edu/ie