DECISION SCIENCE/ OPERATIONS RESEARCH

FACULTY

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PREREQUISITES

- BS degree or equivalent
- Mathematical statistics course (Ex: Stat312)
- Computer programming course (Ex: CS302)
- 3 courses in ISyE (Ex: 313, 315, 320, 323, 349, 415, 417)

The Associate Chair of Graduate Affairs is responsible for evaluating equivalencies.

PROGRAM DESCRIPTION

The program in Decision Science and Operations Research aims to improve the quality of decisions about the management of scarce resources. Such resources not only include capital, but also the quality of human life (e.g., health status), the quality of the environment, and many other important issues.

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.

CORE COURSES (18 credits minimum)

Optimization (6 cr min)

ISyE/CS 525	Linear Programming Methods
ISyE/CS 635	Tools and Environments for Optimization
ISyE/CS 719	Network Flows
ISyE/CS 720	Integer Programming
ISyE 723	Dynamic Programming and Associated Topics
ISyE/CS 726	Nonlinear Programming Theory and Applications
ISyE/CS 727	Non-smooth Optimization
ISyE/CS 730	Nonlinear Programming Algorithms

Stochastic Processes (6 cr min)

ISyE 624	Stochastic Modeling Techniques
ISyE/Math 632	Intro to Stochastic Processes
ISyE/Math 633	Queuing Theory and Stochastic Modeling
ISyE/ME 643	Performance Analysis of Manufacturing Systems

Simulation (3 cr min)

ISyE/OTM 620	Simulation Modeling and Analysis

Organizations, Decisions, And Implementation Issues (3 cr min)

ISyE/ME 513	Analysis of Capital Investments
ISyE 516	Introduction to Dec. Analysis
ISyE 517	Decision Making in Health Care
ISyE/ME 641	Design & Analysis of Manufac. Systems
ISyE 658/ OTM 758	Managing Technological Change in Manufacturing Systems
ISyE/OTM 671	E-Business - Technologies, Strategies and Applications
ISyE/OTM 672	E-Business Transformation - Design, Analysis and Justification
MHR 700	Organizational Behavior
MHR 720	Organization & Management Processes

OTHER COURSES (12 credits)

These courses are chosen to meet your interests and career goals. **Remember that your advisor must approve these courses in advance.** Keep the following guidelines in mind when you plan your program.

1. Any of the courses listed above are acceptable as electives, provided that they are not used to fulfill other requirements.

2. Any course in CS, Math, Statistics, Business, Economics, or Engineering 300 level or above is acceptable **if it is approved by your advisor**.

3. Independent study and project work (up to 6 credits) are encouraged but not required.

4. The following courses are some of the most popular electives.

Popular Electives:

ISyE/CS/Math 425	Combinatorial Optimization
ISyE/ME 510	Facilities Planning
ISyE/ME 512	Inspection, Quality Control, & Reliability
ISyE 575	Introduction to Quality Engineering
ISyE 605	Computer Integrated Manufacturing
ISyE/Psych 653	Organization and Job Design
OTM 700	Operations Management

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 Is or NRs can show on the student's transcript.
- Be enrolled in at least 2cr the semester in which they graduate.
- Have their MS degree warrant signed and dated by the degree deadline.

LABORATORIES & CENTERS

Discrete Event Simulation Lab
Integrated Systems Optimization & Applications Laboratory
Manufacturing Systems Analysis Lab
Operations Research Lab
Optimization Lab
Stochastic Systems Lab
Stochastic Systems Control & Simulation Lab

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

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