Faculty
- Jingshan Li, ME 3222
- Ananth Krishnamurthy, ME 3258
- Leyuan Shi, ME 3250
- Raj Veeramani, ME 4101
- Shiyu Zhou, ME 3254

PREREQUISITES
- BS Degree or equivalent
- Mathematical statistics (Ex. Stat 312)
- Computer programming (Ex. CS 302)
- Three courses in ISYE (Ex: 313, 315, 320, 323, 349, 415, 417)

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

PROGRAM DESCRIPTION
The specialization in Manufacturing and Production Systems is intended to provide the skills and knowledge necessary to compete successfully in a manufacturing environment. These skills include knowledge of the theory of manufacturing materials and processes and their control; knowledge of the essentials of manufacturing systems design and analysis; and knowledge of and hands-on experience with modern manufacturing technology.

MS DEGREE REQUIREMENTS

BROAD CORE COURSES (12 credits)
Select one course from each category:

1) Optimization
   - ISyE 525: Linear Programming Methods
   - ISyE 635: Tools and Environments for Optimization

2) Probability and Stochastic Modeling
   - ISyE 624: Stochastic Modeling Techniques
   - 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 MS degree.

TRACK CORE COURSES - 6 credits
Select two courses from:
- ISyE 510: Facilities Planning
- ISyE 605: Computer Integrated Manufacturing
- ISyE 615: Production Systems Control
- ISyE 645: Engineering Models for Supply Chains

TECHNICAL ELECTIVES - 12 credits
A least 6 credits must be ISyE courses or cross-listed with ISyE

These courses are chosen to meet your interests and career goals. Courses need to be at the 400 level or above.

Sample electives:
- Any of the courses listed as broad core courses or track core courses are acceptable as electives, provided that they are not used to fulfill other requirements.

Courses in ISyE, such as:
- ISyE 415: Introduction to Manufacturing Systems, Design and Analysis
- ISyE 425: Intro to Combinatorial Optimization
- ISyE 449: Sociotechnical Systems in Industry
- ISyE 515: Engineering Management of Continuous Process Improvement
Laboratory for Manufacturing Process Analysis and Control (MPAC)

• In this laboratory, we focus on interdisciplinary research on new methodologies of data analysis, knowledge discovery, and control of manufacturing processes for quality and productivity improvement. The research is based on the fusion of the diverse information sources, such as the in-process sensing information of the machine conditions, and the final product quality information, and the discrete event signals from the logic controller of the process. The research utilizes theories of engineering field knowledge, signal processing, advanced statistical analysis, and system and control.

Flexible Manufacturing Cell Laboratory

• This laboratory enables integrated design, manufacturing, inspection, and assembly. It includes CAD/CAM systems, CNC milling and turning centers, an automated storage and retrieval system, a material-handling conveyor and robots, a CMM integrated with a computer-aided inspection system, and an assembly robot having tactile- and vision-sensing capabilities.

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