Emphasis is placed on the foundations of quality improvement, organizational dynamics/change strategies, business and statistical methods. There is a flexible elective list of courses to enable the student to also develop skills in manufacturing systems, health systems, service systems, and decision sciences.

The PhD degree in Industrial Engineering with a concentration in Quality Engineering seeks to qualify students for leadership positions in research, consulting, government and industry as well as for positions on university faculties in industrial engineering, business and related fields.

CURRICULUM

The curriculum is designed to provide the student with a balance and breadth of understanding of industrial engineering disciplines that contribute to designing and delivering high quality products or services safely and efficiently. To accomplish this, courses can be selected from each of four groupings: (1) foundation courses; (2) organizational dynamics/change strategies and sociotechnical engineering; (3) statistical methods, and (4) a grouping consisting of Industrial Engineering and Business electives.

FOUNDATION COURSES (12 cr)
ISyE/ME 512: Inspection, Quality Control, (or ISyE 612) and Reliability
ISyE 515: Engineering Management of Continuous Process Improvement
ISyE 520: Quality Assurance Systems
ISyE 575: Introduction to Quality Engineering
ISyE 412: Fundamental Industrial Data Analytics

ORGANIZATIONAL DYNAMICS/CHANGE & SOCIOTECHNICAL SYSTEMS (6cr min)
ISyE/Psych 652: Sociotechnical Systems
ISyE/Psych 653: Organization and Job Design
ISyE/Psych 753: Seminar in Organization & Job Design

ORGANIZATIONAL DYNAMICS/CHANGE & SOCIOTECHNICAL SYSTEMS (6cr min)
ISyE 854: Special Topics in Organizational Design
MHR 700: Organizational Behavior
OTM 770: Introduction to Quality & Productivity Improvement

STATISTICAL METHODS (3cr min)
ISyE 612: Information Sensing and Analysis for Manufacturing
STAT 333: Applied Regression Analysis
STAT 349: Introduction to Time Series
STAT 411: Introduction to Sample Survey Theory and Methods
STAT 421: Applied Categorical Data Analysis
STAT 701: Applied Time Series Analysis - Forecasting and Control
STAT 756: Multivariate Analysis
STAT 803: Experimental Design I
STAT 849: Theory and Application of Regression and Analysis of Variance I

ISyE ELECTIVES (3 cr min)
ISyE 417: Health Systems Engineering
ISyE/ME 513: Analysis of Capital Investments
ISyE 610: Design of Program Evaluation Systems
ISyE 613: Systems Evaluation Analysis
ISyE/OTM 620: Simulation Modeling & Analysis
ISyE/ME 641: Design & Analysis of Manufacturing Systems
ISyE 658/OTM 758: Managing Technological Change in Manufacturing Systems
ISyE 691: Special Topics in ISyE (need advisor consent)
ISyE 946: Advanced Topics in Mfg Systems
BUSINESS ELECTIVES (3 cr min)
Suggested Courses:
- MHR 700 Organizational Behavior
- MHR 705 Human Resource Management
- MHR 720 Organization & Management Processes
- MHR 722 Entrepreneurial Management
- OTM 860 Planning for Quality in New Products & Services
- OTM 861 Strategic Breakthrough Management & Quality Planning

INDEPENDENT STUDY
Three additional credits approved in advanced by the student’s advisor are also required. Independent study or an actual quality improvement project from an industrial, health, or service area is required for the 3 credits.

EXIT REQUIREMENTS
In order to be eligible for graduation, a Master’s student must:
- Have a GPA of 3.0 or higher
- Meet all MS degree requirements for their focus area
- Have all grades entered, except for the current semester. No I’s or NR’s can show on the student’s transcript.
- Be enrolled in at least 2 credits the semester in which they graduate.
- Have their MS degree warrant signed and dated by the degree deadline.
- Please note if you earn a grade of C or below in a course you CANNOT count that course toward the 30-credit requirement.

DOCTORAL REQUIREMENTS
The requirements for the PhD degree include a minimum number of 32 credits and include research in area of specialization, satisfactory performance in the Qualifying Exam, the Preliminary Exam, and a successful defense of a PhD thesis. Admission and GPA requirements are the same as those specified by the ISyE Department.

PAST PhD THESIS TITLES


RESEARCH FACILITIES
- Center for Health Systems Research & Analysis (CHSRA)
- Center for Quality and Productivity Improvement (CQPI)
- Quality Engineering and System Transitions Lab
- Interactive Health Communications Laboratory
- Experimental Design and Process Improvement Laboratory

FURTHER INFORMATION
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