Human Factors and Health Systems Engineering

Accelerated Master’s Program

**PREREQUISITES**

- BS degree in industrial engineering or equivalent
- Mathematical statistics (Ex. Stat 312)
- Computer programming (Ex. CS 302)
- Graduate Record Examination (GRE) scores received by December 1st*

*ISyE undergrads and applicants with prior institutional approval are waived from the GRE requirement.

**PROGRAM DESCRIPTION**

The demand for engineers who can combine a concern for the human component with traditional engineering principles is great. The Human Factors and Health Systems Engineering program provides students content from physical ergonomics, cognitive ergonomics, macroergonomics and broad issues in health care, including long-term care, prevention, quality improvement, healthcare financing, and system evaluation. This program considers human reliability, psychomotor capabilities and human characteristics in equipment.

As an important aspect of equipment design is human-computer interaction. Engineers are concerned with the complex physical relationships between people, machines, job demands and work methods, design, work quality and assessment of skill. Also important are organizational issues such as management approaches, job design, participative problem solving, psychological stress, job satisfaction, performance effectiveness, product/service quality, and quality of work life. Effective model building requires strong systems analysis skills. While skill in manipulating statistical and mathematical models is essential to an industrial engineer’s success, the health systems engineer must also be able to initiate resolutions to strategic problems using knowledge of how organizational decisions are made.

**WHAT YOU LEARN**

- Articulates, critiques, or elaborates the theories, research methods, and approaches to inquiry or schools of practice in industrial and systems engineering including areas such as decision science and operations research, quality engineering, manufacturing and health systems, and/or human factors.
- Identifies sources and assembles evidence pertaining to questions or challenges in industrial and systems engineering.
- Selects and/or utilizes the most appropriate industrial and systems engineering methodologies and practices.
- Evaluates or synthesizes information pertaining to questions or challenges in industrial and systems engineering.
- Communicates clearly in ways appropriate to industrial and systems engineering.

**HOW YOU LEARN**

- The flexible curriculum can be personalized to suit your needs.
- Students who hold a graduate degree may transfer up to 9 credits of prior graduate work.
- UW-Madison Industrial Engineering students may count up to 7 credits of coursework numbered 300 or above towards degree.

Please contact CoE Grad Admissions at iegradadmission@engr.wisc.edu; Subject Line: “IE Grad Admissions” with questions. ISyE Seniors please contact Pam Peterson (prpeterson@wisc.edu) with questions.
COURSES (30 Credits)

Below is a typical curriculum for those pursuing a MSIE degree in Human Factors and Health Systems Engineering.

FALL POTENTIAL COURSE OPTIONS:

- ISyE 313: Engineering Economic Analysis
- ISyE 349: Introduction to Human Factors
- ISyE 417: Health Systems Engineering
- ISyE 653: Organization and Job Design
- ISyE 601: 002 - IE Special Topics: Human Computer Interaction

SPRING POTENTIAL COURSE OPTIONS:

- ISyE 313: Engineering Economic Analysis
- ISyE 349: Introduction to Human Factors
- ISyE 417: Health Systems Engineering
- ISyE 555: Human Performance and Accident Causation
- ISyE 559: Patient Safety and Error Reduction in Healthcare
- ISyE 564: Occupational Ergonomics and Biomechanics
- ISyE 575: Introduction to Quality Engineering
- ISyE 601: Special Topics TBD (if offered and advisor approval needed)
- ISyE 608: Safety and Quality in the Medication Use System

SUMMER POTENTIAL COURSE OPTIONS:

- ISyE 313: Engineering Economic Analysis
- ISyE 349: Introduction to Human Factors
- ISyE 516: Introduction to Decision Analysis
- ISyE 575: Introduction to Quality Engineering
- ISyE 601: Special Topics TBD (if offered and advisor approval needed)

COURSES CONTINUED

OTHER DEPARTMENT COURSE SUGGESTIONS:

- Nurs 761: Health Program Planning, Evaluation & Quality Improvement - Spring
- PHS 797: Introduction to Epidemiology - Fall
- PHS 875: Assessment of Medical Technologies - Spring
- PHS 876: Measuring Health Outcomes - Spring
- OTM 753: Health Care Management Operations - Spring
- BMI 576: Introduction to Bioinformatics - Fall
- BMI 773: Clinical Research Informatics - Spring
- BMI 776: Advanced Bioinformatics - Spring

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 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 toward the 30-credit requirement.

JOB PLACEMENT

Engineering Career Services Office
1150 Engineering Hall
1415 Engineering Drive
Madison, WI 53706
Tel: (608) 263-4025
Fax: (608) 890-2204
Email: ecs@engr.wisc.edu
http://ecs.wisc.edu

FURTHER INFORMATION

ISyE Graduate Student Services
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