

HUMAN FACTORS & ERGONOMICS PROGRAM



FACULTY

P. Brennan, 3270 ME, 263-1315
P. Carayon, 3126 ECB, 265-0503
B. Karsh, 3218 ME, 262-3002
J. Lee, 3007 ME, 890-3168
E. Montague, 3222 ME, 890-2562
B. Mutlu, 6381 CS, 262-6635
D. Noyce, 1204 Eng. Hall, 265-1882
R. Radwin, 2106 ECB, 263-6596
M. Sesto, 2104 ECB, 263-5697
G. Vanderheiden, 2112 ECB, 263-5788
D. Wiegmann, 3216 ME, 890-1932
D. Zimmerman, 1163 WARF, 263-4875

PREREQUISITES FOR MS & PhD

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

PROGRAM DESCRIPTION

The Human Factors and Ergonomics Program provides students content from physical ergonomics, cognitive ergonomics, and macroergonomics. Students who apply for both the MS and Ph.D. degrees will be processed for each degree separately. Acceptance for the MS does not automatically ensure acceptance for the Ph.D.

MS DEGREE REQUIREMENTS

TOTAL 30 Credits*

- ISYE 349 Introduction to Human Factors or equivalent is required. It is a prerequisite for all other curriculum courses (required, but does not count toward the 30 credits)
- 9 credits of foundation courses. Take 1 course in cognitive ergonomics (C), physical ergonomics (P), and macroergonomics (M). Courses that count for multiple areas can be counted toward only one area.
- 9-12 credits of human factors and ergonomic electives beyond those taken as foundation courses
- 6 credits of Tools and Methods
- 3-6 credits of MS Project or Thesis
- You may count multiple IE 816, 854, 859 and 961 graduate seminars toward satisfying the MS Degree Requirements. Your advisor will determine if a seminar counts toward a human factors/ergonomic elective or Tools/Methods.

ISYE 552 Human Factors Design (C, P, M)
ISYE 555 Human Performance & Accident Causation (C, P, M)
ISYE 556 Occupational Safety & Health Engineering (C, M)
ISYE 559 Patient Safety & Error Reduction (C, M)
ISYE 564 Occupational Ergonomics (P)
ISYE 565 Ergonomics in Service (P)
ISYE 610 Program Evaluation (M)
ISYE 652 Sociotechnical Systems (M)
ISYE 653 Job and Organization Design (M)
ISYE 662 Design for Human Disability & Aging (P)
ISYE 691 Human Computer Interaction (C)
ISYE 691 C, P, or M depending on topic
ISYE 692 C, P, or M depending on topic
ISYE 699 C, P, or M depending on topic

ISYE 753 Seminar in Org and Job Design (M)
ISYE 756 Seminar in Technology & Society (M)
ISYE 764 Occupational Biomechanics (P)
ISYE 854 Seminar C, P, or M depending on topic
ISYE 859 Seminar C, P, or M depending on topic
ISYE 961 Seminar C, P, or M depending on topic

TOOLS AND METHODS (6 cr)

Various courses count as 'Tools and Methods'. On a yearly basis, the HFE faculty group updates the list of 'Tools and Methods' courses. Advisors will decide which set of 'Tools and Methods' courses is appropriate for the students. Following are categories of 'Tools and Methods' courses.

- *Research Methods*
- *Statistics*
- *Qualitative Research*
- *Biomechanics Methods*

Please refer to the Tools and Methods list for details.

MS PROJECT or THESIS (3-6 cr)

IE 699 Advanced Independent Study
IE 790 Research & Thesis for MS degree

MASTER'S PROJECT REQUIREMENT

All human factors graduate students are required to satisfactorily complete at least three credit hours devoted to directed research, design, development, or application, and prepare a written report covering this work. Students expecting to continue for the Ph.D. degree are encouraged to write a Master's Thesis. The choice of writing a formal thesis or a research report is made between each student and their advisor.

Effective Fall 2010 Incoming Class

EXIT REQUIREMENT

In order to be eligible for graduation, an MS student must:

- Have a GPA of 3.0 or higher
- Meet all MS degree requirements
- 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.

DOCTORAL REQUIREMENTS

- 32 graduate credits taken as a graduate student; at least 1 year of academic residence
- Three types of course requirements:
 - (1) ISYE PhD student Breadth Requirement
 - (2) Prior to the Qualifying Exam, take one cognitive ergonomics, physical ergonomics, and macroergonomics course from the list on page 1.
 - (3) Prior to defending your dissertation complete at least 6 seminar/special topics courses at the 700 level or above totaling a minimum of 12 credits; at least 3 totaling at least 6 credits of these must be in the Human Factors and Ergonomics area.
- Successful completion of Qualifying Exam requirements. The ISYE policies for Qualifying Exams are located at http://www.engr.wisc.edu/ie/IEP_08_1_Qualifying_Exams.pdf. HFE qualifying exam procedures are explained in the document "Human Factors and Ergonomics Qualifying Exam Process" located at the ISYE website.
- Minor concentration of at least 10 credits. <http://www.grad.wisc.edu/catalog/degreqG.html>
- Successful completion of Preliminary Exam and Final Defense

LABORATORIES & CENTERS

Center for Quality & Productivity Improvement – Carayon (Director), Karsh, Montague, Wiegmann, Lee, Sesto
CHESS – Comprehensive Health Enhancement Support System - Gustafson
Cognitive Systems Laboratory – Lee (PI), Noyce
Naturalistic Decision Making and Simulation Lab - Wiegmann
Human-Computer Interaction Lab (in ISYE) – Montague
Human-Computer Interaction Lab (in CS) - Mutlu
MacroErgonomics Safety & Health (MESH) Lab - Karsh
Occupational Ergonomics & Biomechanics Lab – Radwin (PI) and Sesto
Trace Research & Development Center – Vanderheiden (Director), Radwin, Sesto, Wiegmann
Wisconsin Traffic Operations and Safety (TOPS) Laboratory – Noyce (PI), Lee

RESEARCH & TEACHING OPPORTUNITIES

Graduate students may have the opportunity to serve as teaching assistants for human factors courses. Students interested in research assistantships are encouraged to contact the professor, laboratory director or center director in their area of interest.

RECENT PH.D. DISSERTATIONS

Chia-Hua Ku - The Effects of Organizational Factors and Scheduling On Fatigue, Health, and Social Well-Being of Locomotive Crews (2006)
Dennis Jones - Relationship Between Working Conditions and Musculoskeletal Disorders in

An Assembly Facility: A Participatory Ergonomic (2006)

Sara Kraemer - An adversarial viewpoint of human and organizational factors in computer and information security (2006)

Kamisha Hamilton Escoto - An exploration of the impact of work factors on nurses' perceptions of quality of care (2006)

Kara Schulz – The perceived workload of ICU physicians and physician extenders and its relationship to burnout, patient safety and quality of care (2008)

Calvin Or - Development of a model of health information technology acceptance (2008)

Richard Holden – An investigation of hospital physician beliefs about and experiences with electronic medical records (2009)

Samuel Alper – Exploring the causes of violations in the medication administration process (2009)

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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Industrial Engineering Department
1513 University Avenue, Room 3182
Madison, WI 53706-1572
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