



**Department of Industrial  
and Systems Engineering**  
UNIVERSITY OF WISCONSIN-MADISON

# Human Factors & Ergonomics

## Core Faculty

- Pascale Carayon, 3126 ECB
- John Lee, 3007 ME
- Robert Radwin, 2106 ECB
- Nicole Werner, 3021 ME
- Doug Wiegmann, 3214 ME
- Gabriel Zayas-Caban, 3011 ME

## Affiliate Faculty

- Caprice Greenberg, K6/148, 1690 Clinical Science Ctr.
- David Gustafson, 4109 ME
- Bilge Mutlu, 6381 CS
- David Noyce, 1204 Eng. Hall
- Carla Pugh, G4/704, 7375 Clinical Sci.
- Mary Sesto, 2104 ECB
- Linsey Steege, 4127 Cooper Hall

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



## 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 one course in cognitive ergonomics (C), physical ergonomics (P), and macroergonomics (M). Courses in 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 ISyE 816, 854, 859 and 961 graduate seminars toward satisfying the MS degree requirements. Your advisor will determine if seminar counts toward human factors/ergonomic elective or toward Tools and Methods.

Please note if you earn a grade of C or below in a course you CANNOT count that course toward the 30-credit requirement.

- ISyE 552: Human Factors Design (C,P,M)
- ISyE 555: Human Performance & Accident Causation (C,P,M)
- ISyE 556: Occupational Safety & Health Eng (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
- CEE 679: Advanced Topics in Transportation Safety (C)

## TOOLS AND METHODS (6 cr.)

Various courses count as "Tools and Methods." The HFE faculty group updates the list of "Tools and Methods" courses and advisors decide which set of "Tools and Methods" courses are appropriate for each student. The following are categories of "Tools and Methods".

### Course:

- Research Methods
- Statistics
- Qualitative Research
- Biomechanics Methods

See Tools and Methods list on our website for details.

## MASTER'S PROJECT OR THESIS (3-6 CR)

- ISyE 699: Advanced Independent Study
- ISyE 790: Research & Thesis for MS Degree

## MASTER'S PROJECT

All human factors graduate students are required to satisfactorily complete at least 3 credit hours devoted to directed research, design, development, or application, and prepare a written report covering this work. Students expecting to continue for the PhD 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.

## 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 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.

## DOCTORAL ELECTIVES

- 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 approved by the student's major advisor.

Any courses 400 level or above in Engineering, Mathematics, Statistics, Business, Computer Sciences, Economics, Population Health Sciences, or Psychology **if it is approved by your advisor.** Successful completion of Qualifying Exam requirements. The ISyE policies for Qualifying Exams are located at [https://www.engr.wisc.edu/app/uploads/2016/02/IEP\\_08\\_1\\_Qualifying\\_Exams.pdf](https://www.engr.wisc.edu/app/uploads/2016/02/IEP_08_1_Qualifying_Exams.pdf)

## DOCTORAL REQUIREMENTS CONTD

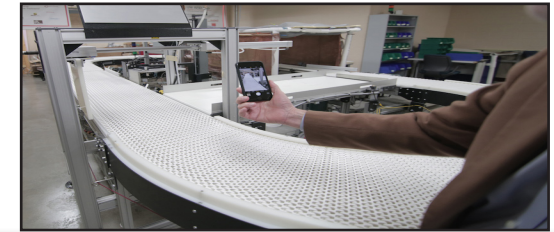
- HFE qualifying exam procedures are explained in the document "Human Factors and Ergonomics Qualifying Exam Process" located on the ISyE website.
- Minor concentration of at least 10 credits. [https://grad.wisc.edu/catalog/degrees\\_industrialengr.htm](https://grad.wisc.edu/catalog/degrees_industrialengr.htm)
- Successful completion of Preliminary Exam and Final Defense.

## LABORATORIES & CENTERS

- Center for Quality & Productivity Improvement (CQPI) – Pascale Carayon (Director)
- Cognitive Systems Laboratory – Lee (PI)
- Naturalistic Decision Making and Simulation Lab – Wiegmann
- Human-Computer Interaction Lab – Mutlu
- Occupational Ergonomics & Biomechanics Lab – Radwin (PI), Sesto
- Wisconsin Traffic Operations and Safety Laboratory (TOPS) – Noyce (PI)
- Werner Lab – Nicole Werner (PI)

## 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 PhD DISSERTATIONS

- A Longitudinal Study of the Process & Content of a Participatory Organization Intervention
- Physical Stress Measurements for Work-Related Musculoskeletal Disorders Using Video-Based Continuous Biomechanical Data Acquisition and Interactive Exposure Analysis

## RECENT PhD DISSERTATIONS

- A Case-Control Study of Medication Use and Occupational Injury
- Effect of Work Conditions on VDT Workers' Health & Productivity: A Longitudinal Intervention Field Study in a Service Organization

## 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

University of Wisconsin-Madison  
ISyE Graduate Student Services  
3182 Mechanical Engineering  
1513 University Avenue  
Madison, WI 53706  
Tel: (608) 263-4025  
Fax: (608) 890-2204  
Email: [iegradadmission@engr.wisc.edu](mailto:iegradadmission@engr.wisc.edu)  
<http://www.engr.wisc.edu/ie>