

Human Factors Emphasis Area

The field of Human Factors in Industrial Engineering focuses on the design of tools, machines, systems, tasks, jobs and environments for safe, comfortable and effective human involvement and interaction. The field is characterized by the systematic application of knowledge about sensory, perceptual, mental and psychomotor characteristics.

Industrial engineers with a Human Factors background are better able to create designs that take into account human abilities and limitations, both physical and cognitive. Physical applications include the design of working environments that are safe and comfortable taking into consideration typical as well as handicapped physical human characteristics. Cognitive applications take into account the ways humans perceive, understand, and react to stimuli – and work to support safe, efficient, and expedient responses. Designs by Human Factors engineers aim to enhance operational use while simultaneously improving the quality of working life.

Human Factors expertise is desired in industries requiring frequent interactions between humans and systems, such as the transportation, manufacturing, and healthcare industries. Example applications include laying out effective computerized information displays for doctor in operating rooms, designing ways that handicapped individuals can productively operate vehicles, determining mechanisms to keep workers safe in machining operations, and creating software logic to determine if drivers are impaired - and then processes to safely override impaired drivers actions.

Human Factors specialists have extensive knowledge of

- Human perception and cognition
- Characteristics of humans
- Human computer interaction
- Ergonomics

Human Factors specialists have effective technical skills in

- Work measurement
- Job and task design and analysis
- Modeling and problem-solving
- Design of experiments

Courses

Courses taken from the following groupings help to provide students with a deeper understanding of financial engineering. More information on each of these courses can be obtained by logging onto [myPurdue](#), navigating to the course catalog page for that department and clicking on the link for the course.

The courses listed below are listed in the course catalog for each department. They are meant to provide guidance as to what a student might take if they are interested in this emphasis area. The list of courses below is not exhaustive. In addition, the regularity of offerings of the listed courses is not guaranteed. Some courses are offered every semester, every other semester, or every other year. Other courses may have been offered at some point, but may not be offered again for a while, and we keep them in this list in hopes they will be offered again. *Therefore, the courses listed here should be considered an unreliable source of information.* A student wishing to take a particular course should always check the course schedule (via "Look Up Classes" in myPurdue) to see what is available.

Legend:

REQ: Required for IE majors

TE: Technical Elective

GE: General Education Elective

*: Course has not yet been pre-approved by the IE faculty as a TE, but approval is pending. A student may wish to petition for the immediate approval.

Statistics and Design of Experiments

- IE 533: Industrial Applications of Statistics (TE)
- STAT 512: Applied Regression Analysis (TE)
- STAT 514: Design of Experiments (TE)

Ergonomics

- IE 386: Work Analysis and Design I (REQ)
- IE 556: Job Design (TE)
- IE 558: Safety Engineering (TE)

Human Perception and Cognition

- IE 486: Work Analysis and Design (REQ)
- IE 559: Cognitive Engineering of Interactive Software (TE)
- IE 577: Human Factors in Engineering (TE)

Characteristics of Humans

- PSY 120: Elementary Psychology (GE)
- PSY 272: Psychological Foundations of Work Behavior (GE/TE)
- PSY 285: Consumer Behavior (GE)
- PSY 310: Sensory and Perceptual Processes (TE)
- PSY 314: Introduction to Learning (GE/TE)
- PSY 333: Motivation (GE/TE)
- PSY 475: Work Motivation and Job Satisfaction (GE/TE)
- PSY 511: Psychophysics *

Compatible Minors

- Psychology
- Statistics

Human Factors faculty in Industrial Engineering

- Barrett Caldwell
- Vincent Duffy
- Steven Landry
- Mark Lehto
- Sara McComb
- Ji Soo Yi

Relevant links

- [Human Factors and Ergonomics Society](#)

DISCLAIMER: The emphasis area document is intended for use as an aid to students for developing a coherent curriculum plan. The courses listed are a representation of the courses that may be taken (or are taken as part of the IE curriculum) that develop skills that are needed for a career in a field focusing on this emphasis area. While we list required IE courses, students should strongly consider enhancing their base IE coursework with more advanced courses in one or more of the areas.