Course Goals

Upon completion of ISE 412, students will be able to:

- Develop, conduct, and evaluate the results of human factors research.
- Develop models of human-machine systems.
- Develop information requirements based on understanding of human sensory processing and cognition.
- Develop action requirements based on understanding of human response capabilities and limitations.
- Design human-machine interactive systems based on appropriate models, information and action requirements, and an understanding of human abilities, limitations, and preferences.
In addition, you should be able to …

- Listen purposefully.
- Observe actively.
- Ask questions to gain a deeper understanding.
- Use observation and questioning to better understand how people relate to technology and their environment (and vice versa).

Background: History of Human Factors

**EARLY DAYS ...**
- understanding complexity

**LATER ...**

**NOW ...**
- pervasive human factors
The Designer’s Dilemma

Modern Human Factors Understands That …

PEOPLE USE TECHNOLOGY … TO ACCOMPLISH THEIR GOALS … IN THEIR ENVIRONMENT.
Related Fields

![Diagram of related fields]

**FIGURE 1.3**
The relationship between human factors, shown at the center, and other related disciplines of study. Those more closely related to human factors are shown at the top, and those related to engineering are point.

Understanding the Human Factors Problem

How does the person understand the situation? How does he/she know what to do?

- What actions are available? How are they initiated?
- What is the result of the person's action?
- How is information obtained/presented?
- What information is needed? What is available?
HF in Complex Systems (aka, Human-Systems Integration)

Understanding HF in Consumer Products

- Hierarchy of User Needs (from Bonapace, 2002)
  - pleasure
  - usability
  - functionality
  - safety and well-being

Examples …
Human Factors in the Product Development Process

- Identify behaviors, perceptions, beliefs and attitudes
- Develop user experience map
- Identify user types / styles of use
- Develop process maps and/or user models and interaction styles
- Investigate habits and practices
- Culture & Lifestyle
- Identify unmet latent needs/desires
- Benchmarking

HF design requirements
- Design guidance / recommendation
- Professional assessment
- Concept evaluation
- Benchmarking

Design guidance
- Professional assessment
- Product evaluation
- Benchmarking

Field testing
- Follow up research
- Benchmarking

Research → Model → Define Reqts. → Design → Evaluation