

Human Factors Engineering

- How to design systems that take advantage of people's capabilities and compensate for their limitations
- **If a system doesn't work for people it doesn't work!**
- Both:
 - A skill set for *every* engineer
 - A unique career

Human Factors Faculty



Birsen Donmez



Mark Chignell



Greg Jamieson

Full-time



Paul Milgram



Justin Hollands



Alison Smiley

Adjunct



Olivier St. Cyr



Paul Eisen (+ Paul White)



MIE Human Factors Curriculum

	Fall	Winter
Year 2	MIE 242: Psychology for Engineers (core)	MIE240: Human-Centred Systems Design (core)
Year 3	MIE343: Industrial Ergonomics and the Workplace (core)	MIE345: Case Studies in Human Factors and Ergonomics (tech elective)
	MIE344: Ergonomic Design of Information Systems (tech elective)	
Year 4	MIE523: Engineering Psychology and Human Performance (tech elective)	MIE542: Human Factors Integration (tech elective)
	MIE344: Ergonomic Design of Information Systems (tech elective)	MIE345: Case Studies in Human Factors and Ergonomics (tech elective)

(In terms of the *number* of undergraduate courses offered (7), the UofT HF programme is among the *largest* in North America.)

MIE343 (F): Industrial Ergonomics and the Workplace

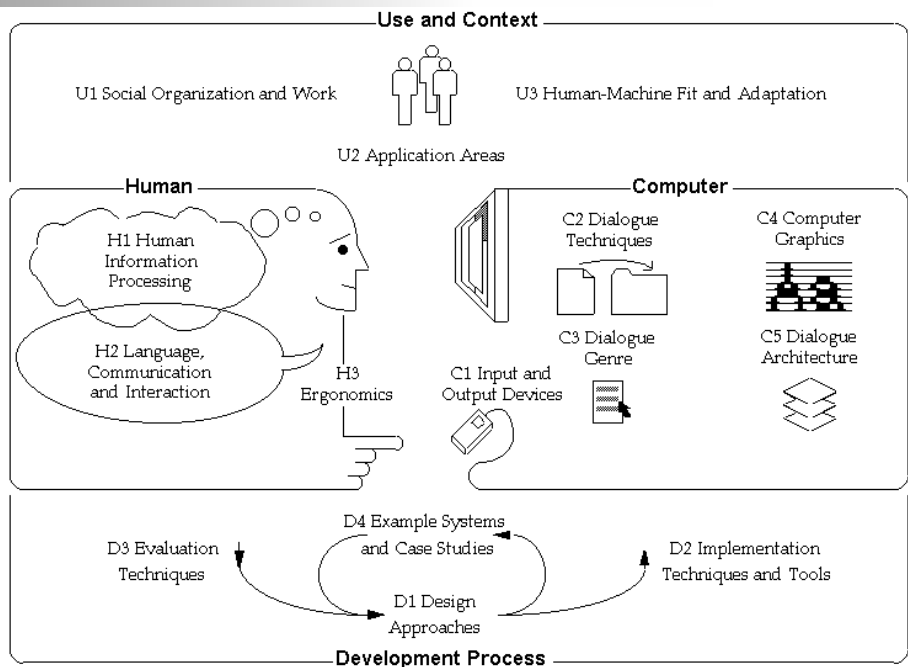


1. Anatomical & physiological factors underlying design of equipment and work places.
2. Biomechanical factors governing physical workload and motor performance.
3. Circadian rhythms & shift work.
4. Measurement and specification of heat, light, and sound with respect to design of work environments.

MIE344 (F): Ergonomic Design of Information Systems



1. Design of human-machine interfaces, and analysis of the impact of computers on people
2. Usability engineering, rapid prototyping design, analysis of user mental models and their compatibility with design models, quantitative modelling of human-computer interaction, etc.
3. New developments in social computing and collaboration technologies that are relevant to interaction design



MIE345 (S): Case Studies in Ergonomics

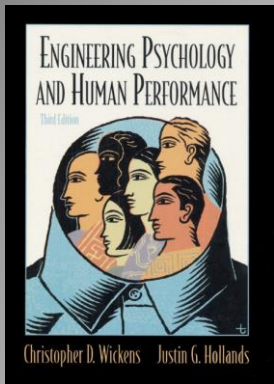


- A detailed analysis of numerous cases in which HF methods have been applied to improve the efficiency with which human-machine systems operate.
- for example:
 - airport signage,
 - expert witnessing
 - human factors forensics
 - (e.g., Hinton train collision),
 - proposal writing



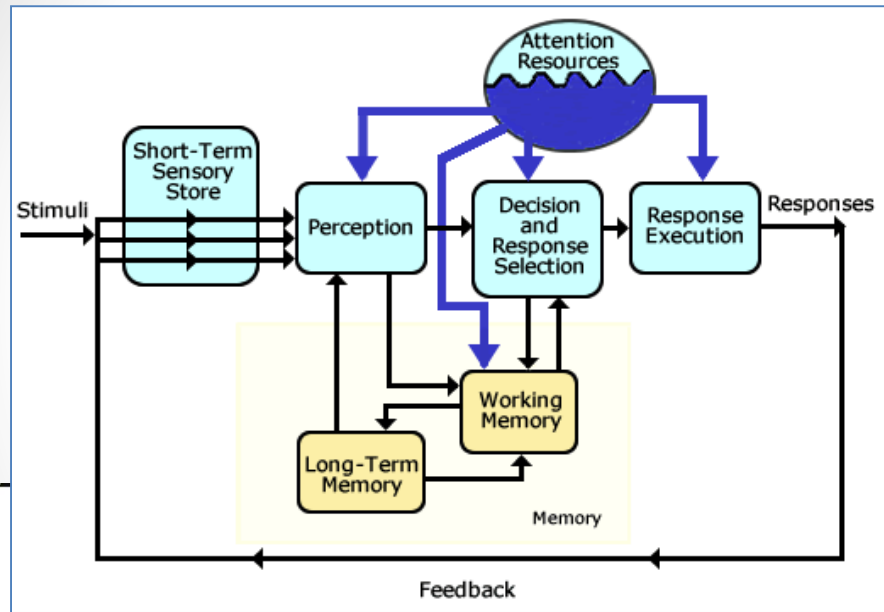
Human Factors Curriculum

	Fall	Winter
Year 2	MIE 242: Psychology for Engineers (core)	MIE240: Human-Centred Systems Design (core)
Year 3	MIE343: Industrial Ergonomics and the Workplace (core)	MIE345: Case Studies in Human Factors and Ergonomics (tech elective)
	MIE344: Ergonomic Design of Information Systems (tech elective)	
Year 4	MIE523: Engineering Psychology and Human Performance (tech elective)	MIE542: Human Factors Integration (tech elective)
	MIE344: Ergonomic Design of Information Systems (tech elective)	MIE345: Case Studies in Human Factors and Ergonomics (tech elective)



MIE523 (F): Engineering Psychology and Human Performance

Examines relationship between human information processing and design of (complex) human-machine systems.



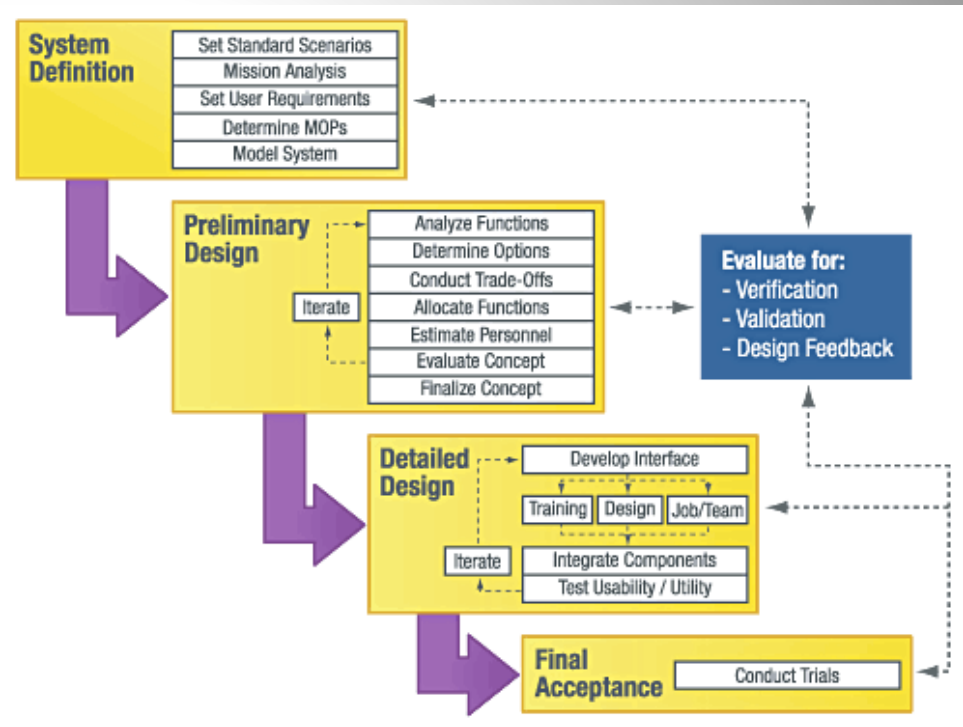
“Old-fashioned”



“Modern” Cockpit



MIE542 (S): Human Factors Integration (HFI)



1. Integration of HF into engineering projects.
2. HFI tools, and HFI best practices.
3. Modelling, economics, and communication of HFI problems.
4. Examples of HFI, from energy, healthcare, military, software systems ..
5. Application of HFI theory and methods to capstone design, including HFI problem specification, concept generation, and selection, through an iterative and open-ended design process.

Where are HF practitioners working?

- Health Care / Medical Informatics
- Software / Information Technology
- Telecommunications
- Consumer Electronics
- Aviation / Space
- Process Control
- Manufacturing
- Military (Research & Practice)
- Research & development
- Private Consulting
- Forensics
- University
-