

DEA 4700 - Environmental Analysis 1: Applied Ergonomics Methods

Course Overview

- ❖ DEA 4700 syllabus (DEA6700 syllabus) –
<http://ergo.human.cornell.edu>
- ❖ DEA4700 - 2 mini-projects:
 - ❖ Physical ergonomics – TBA
 - ❖ Cognitive ergonomics – TBA

Ergonomics/Human Factors

- ❖ Ergonomics (European) and Human Factors (US) basically are the same disciplines.
- ❖ Ergonomics is the ‘science of work’, from ‘ergon’ or ‘ergos’ (Greek - work) and ‘nomos’ or ‘nomikos’ (Greek - laws).
- ❖ Ergonomics is multidisciplinary.
- ❖ Ergonomics uses multiple methods.
- ❖ Ergonomics focuses on USERS.
- ❖ If it doesn’t affect design in some way, it isn’t ergonomics!

Ergonomics - Physical design

User-technology physical interface design

- ❖ Who are the users?
- ❖ How does the technology fit different user dimensions?
- ❖ How does the technology fit user anatomy?
- ❖ How does the technology fit user strength?
- ❖ How does the technology accommodate different abilities?
- ❖ How safe is the technology (health, comfort, performance)?
- ❖ How do users interact with technology?

Ergonomics - Cognitive design

User-technology cognitive interface design

- ❖ How do users expect the technology to work?
- ❖ How is information displayed?
- ❖ How well are stereotypical expectations met?
- ❖ How complex is the interface?
- ❖ How much training is required?

- ❖ What user knowledge assumptions are made?

Ergonomics - Layout

Workplace design and workspace layout

- ❖ Are the work items optimally positioned in terms of comfort, convenience, layout and frequency of use?
- ❖ How well does the layout support work flow?
- ❖ Who can be accommodated by the layout?
- ❖ How flexible is the layout when work content changes?

Ergonomics - Ambient conditions

- ❖ Physical environment conditions at work
- ❖ What are the prevailing climate conditions that could affect performance (thermal, luminous, acoustic, vibration, air quality, electromagnetic fields)?
- ❖ What are the exposures?
- ❖ What acclimation can occur?
- ❖ What protection is required?

Ergonomics - Work content

- ❖ Job design, selection and training
- ❖ What are the work patterns (shifts etc.)
- ❖ What are the work tasks?
- ❖ What are the required skills?
 - ❖ Physical
 - ❖ Cognitive
 - ❖ Social
- ❖ What are the training needs?
- ❖ What can be simulated?

Macroergonomics

Organizational design and management

- ❖ How should users be organized?
- ❖ How should teams work?
- ❖ What motivates users?
- ❖ How should functions be allocated?
- ❖ How should teams be led?
- ❖ What are the opportunities for participatory ergonomics?

Ergonomics - Systems thinking

- ❖ User – Interface – Technology components