Syllabus
ASEN 4128 Human Factors in Engineering and Design

Human Factors in Engineering and Design Course Description:

In this course we investigate the relationship between human operators and the complex systems they interact with.

Our focus will be: how do we account for human's cognitive and physical limitations when designing a complex system.

We will start with learning some of the basic limitations that we as human possess, as we do this we will review the large variety of accidents that can be attributed to human limitations. The focus is primarily on aviation design and aviation accidents as this field of study highlights the truly tragic ramifications of poor design. That said, the principles addressed in this course are relevant to all CU engineering disciplines.

Students will begin with lectures pertaining to the many HF disciplines and issues involved in designing with human limitations considered. HF issues will be highlighted by reviewing aircraft accidents and focusing on the latent conditions that existed in the design long before the aircraft ever flew.

Students will be able to conduct some basic labs where they conduct task analyses, complete ergonomic, usability and workplace assessments and work towards a group project of designing and assessing a cockpit for a specific aircraft role.

The field of human factors is growing rapidly, across multiple industry sectors. This course will introduce students to the field and may lead to a future as a multi-disciplined engineer, a skill-set that employers find very appealing.

Instructor: Hank Scott, Adjunct Instructor

Email: *hank.scott@colorado.edu*

Prerequisites: Open to all Engineering majors.

Textbooks:

1. Human Factors in Engineering and Design, 7th Edition, Sanders and McCormick(1993) McGraw-Hill

Free copy can be downloaded here:
https://docs.google.com/file/d/0B8G1Rj25DjhXaGo0eGhaNnJ0SjA/edit?usp=docslist_api

Grading Breakdown:

Mid-term Exam 20%
Final Exam 20%
Workload Assessment (completed in a small group of 3 – 4 students) 20%
Complex Systems/Cockpit Design Assessment 30%
Attendance/Participation/Attitude 10%

Required Readings:

Publications:

- Human Factors in Engineering and Design, 7th Edition, Sanders and McCormick (1993) McGraw-Hill

Other Sources:

- Excerpts from Mil-standards:

  1472F Human Engineering,
  1333 Aircrew Station Geometry,
  1787C Aircraft Display Symbology, Interface Standard
  850B Aircrew Station Vision
  UK MOD-STD 00-25 (UK Military HF Standards).

Course Schedule:

Introduction
SHELL/Reason Model/Human Subjects in Research

Module 1 - The Senses
Sight/Depth Perception/Optic Flow
Touch/Smell/Proprioceptors/Vestibular/Hearing

Module 2 - Information Processing
Information Processing/Signal Detection/Perception
Attention/Distraction/Vigilance
Memory/Selection and Decision Making/Human Error

Module 3 - Human Performance Limitations and Work Environment
Heat/Noise/Vibration/Altitude/G Loading/Illumination
Affordability/Compatibility
Workload Measurement

Module 4 - Ergonomics
Controls and Displays/Cockpit Assessment
Reach Zones/Measures/Population

ADA:

If you qualify for accommodations because of a disability, please submit to your professor a letter from Disability Services in a timely manner (for exam accommodations provide your letter at least one week prior to the exam) so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities. Contact Disability Services at 303-492-8671 or by e-mail at dsinfo@colorado.edu.

Religious Observance

Campus policy regarding religious observances requires that faculty make every effort to deal reasonably and fairly with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. In this class, {{insert your procedures here}} See full details at http://www.colorado.edu/policies/fac_relig.html

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