

SYSE 4010 - Human- Machine Systems: Design and Analysis

This course is required for all Engineering majors pursuing the Systems Engineering concentration.

Course Coordinator:

Evelyn C. Brown

Catalog Description:

Introduces measurement, evaluation, implementation, communication, equipment, and data for developing and implementing human /machine /environment systems in industrial and consumer contexts. Explores techniques to assess visual, auditory, cognitive, and physical capabilities of individuals. Emphasizes systems approach, with a special interest in the human/machine interface. Explores interaction of environment and individual to enable designers and/or managers to reduce errors, increase productivity, and enhance both safety and comfort, while performing tasks.

Course Structure:

Two 75-minute lectures per week (three credits)

Prerequisites:

MATH 3307, SYSE 3010

Required Material:

1. *Human Factors in Systems Engineering*, Alphonse Chapanis, John Wiley & Sons, ISBN is 0-471-13782-0

Course Objectives:

Upon completion of this course each student will be able to:

- Select and apply relevant information from ergonomic and safety codes and standards.
- Describe the primary methods of measuring the interface of humans and their environment.
- Design and analyze systems in which humans interface with machines or external mechanisms.
- Define and analyze human-machine issues in safety, productivity and ergonomics and develop solutions to improve the ability of humans to interface with mechanisms and their environment.

Lecture Topics:

- Human Involvement with Machines and Systems (1 class)
- Systems and Systems Engineering (2 classes)
- Standards, Codes, Specifications, and Other Work Products (4 classes)
- Human-Factors Methods (4 classes)
- Design for Usability (4 classes)
- Human Physical Characteristics (4 classes)
- Human Mental Characteristics (4 classes)
- Personnel Selection and Training (3 classes)
- System Requirements (2 classes)

Relevant Program Outcomes:

Graduates of the Engineering Program will demonstrate:

- c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- j) a knowledge of contemporary issues
- l) an ability to apply engineering concepts to an area of concentrated study, chosen from systems engineering, engineering management, bioprocess engineering, and biomedical engineering.

Professional Component Content:

Math/Science: 0; Engineering: 3 credits; General Education: 0

Assessment Requirements:

Student Work Samples:

Semester Project (outcome c) to demonstrate skills in completing a systems engineering design involving human aspects.

Homework Assignments (1)

Student Course Survey

Last Review:

January 11, 2008 by Evelyn C. Brown