

**HUMAN FACTORS IN ENGINEERING**  
**EIN 4243            SEC 01**  
**TR 16:10 - 17:25**

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Fall 2006  
Office Hours: TR 15:00-16:00  
TA: Rodrigo Gonzalez  
TA: Office Hours MW 2-5pm

**Course objectives:** This course provides undergraduates with basic knowledge about cognitive engineering and system design.

**Learning outcomes:** By the end of the semester, you should:

1. Understand the way people process information
2. Understand the way users interact with products and systems
3. Be able to predict interaction problems
4. Be able to design products and systems to maximize user effectiveness
5. Understand that it is better to try and be wrong then not to try at all

**Books:** *The Design of Everyday Things*: Norman, D. Basic Books, 2002.  
Student membership in Human Factors and Ergonomics Society

8/29 8/31            Introduction to Human Factors Engineering Design Process - **Project Assignments**

**Methods**

9/5 9/7            Testing Methods, Design of Everyday Things (Ch 1-2) - **Paper Review Due**

9/12 9/14            The Design of Everyday Things (Ch 3-4), Product Evaluation - **Project Proposal Forms Due**

9/19 9/21            Product Evaluation, Cognition Introduction - **Testing Homework Due**

**Theory**

9/26 9/28            Information Processing, Learning and Mental Models – **Project User Requirements Document Due (schedule Schema Lab)**

10/3 10/5            Information Processing, Learning and Mental Models - **Product Evaluation Homework Due (schedule Attention Lab; do Schema Lab)**

10/10 10/12            Memory, Attention - **Project Proposal Due (do Attention Lab)**

10/17 10/19            Human Factors Conference in San Francisco - **Schema Lab Due (schedule Decision Making lab)**

10/24 10/26            Decision Making – **Attention Lab Due (do Decision Making Lab)**

10/31 11/2            Design for Error (Ch 5-7) - **Decision Making Lab Due**

11/7 11/9            Overview of Cognition, **Midterm - Design for Error Homework Due**

**Applications**

11/14 11/16            Project Design Critiques - **Empirical Testing Proposal Due**

11/21            Design Case Study, Cognitive Simulation

11/28 11/30            Applications of your choice

12/5 12/7            Project Presentations

12/12            Project Quiz - **Paper Review Part II Due**

Project Minutes due: 9/14, 9/28, 10/12, 11/2, 11/16, 11/30, 12/11 (with project)

Course requirements:

#### Project Chapters

Chapters of the project will be periodically due throughout the term. These chapters will not be graded. I will provide you with feedback which you can use to make sure that your project is complete. I expect you to incorporate my comments into your final report at the end of the term. Even though they are only graded pass/fail, I expect them to be complete, and handed in on time. The more you give me, the more advice I can offer for your final project.

#### Project Minutes

In order to keep track of specific milestones and methods for your project, you should record minutes of all team meetings. The minutes should include the date and time of the meeting, who is present, what is discussed, and what decisions are made. List which members are responsible for which activities. This is very important if you ever want to apply for a patent on anything you design. It is a good practice to get into. Minutes will be collected every other week, and will be graded pass/fail. They are worth 5% of your grade. **Use the form I hand out.**

#### Homework and Labs

Homework and labs will be collected at the **beginning** of the class period in which they are due. Excuses for late homework will only be accepted for **good** reasons which must be provided and approved at least one hour before class. Excuses at the beginning of class will **NOT** be accepted. I will still correct unexcused late papers but points will be taken off. Labs will occur periodically throughout the semester. Some of them are field studies and some will be done in EAS 3140. Labs and homework will be worth a total of 50% of your final grade. All homework and labs should be written clearly (typing is preferred). Incorrect spelling and grammar **will** lower your grade so try to get assignments proofread. Make sure to justify any conclusions that you draw. *Why* something occurs is more important than *what* occurs. I expect you to spend enough time on each homework and lab to do a good job. Labs and homeworks will require between 3 and 10 hours each.

#### Midterm

There will be a midterm on Thursday 11/9 that will cover the information processing material we have covered up to that point and all material from the textbook chapters that were assigned. I will try to make sample questions available to you a week before the exam. If due to some catastrophe/emergency you are unable to attend the exam, let me know **as soon as you know**. Excuses at or after the exam will not be accepted. I will try to accommodate you if **I** think the excuse is valid. The midterm is worth 15% of your final grade.

#### Project

The most important part of the class is the final project. By the end of class (or tomorrow at the latest), please give me a prioritized list of what projects you are interested in. I will tell you by Friday to which one you have been assigned. Project groups will consist of three or four students. If you have your own idea for a project, I will consider it, but only until the end of the day tomorrow.

Proposals are due on October 12. These are worth 5% of your grade. In the proposal you should have identified the human factors issues that will be the basis of your analysis and redesign, the user needs that you are targeting, an overview of the competition, and the approach you will use to solve the problem.

Your group will make an oral presentation during the final week of class. This presentation should be professional and convincing. Visual aids should be informative and clear. Imagine I am your boss and your job depends on convincing me that your solutions will improve the product or system and be cost effective and marketable. The presentation is worth 5% of your grade. Mockups and prototypes will help your presentation considerably.

Final reports are due on **Monday 12/11 at noon**. The report should be a complete evaluation and analysis of all issues that were mentioned in your proposal, as well as all additional issues that arose since then. It is important that you do not just tell me what human factors solutions you have come up with, but justify each solution with human factors theory **and** user testing. These reports are due a few days after your oral presentation to allow you to include any questions that were brought up then. The final report should be written in *impeccable* English, be convincing, clear, concise, complete, professional etc. It should include all of the chapters from the semester, data from your testing, and prototypes or simulations of the proposed design. If you have any questions concerning what should be included, you are better off asking me than guessing. I will be happy to answer any questions about your project at any point throughout the term. The final report is worth 15% of your final grade. You should turn in a CD copy for me to keep and a hard copy for me to grade and turn back to you.

#### Project Quiz

During the final exam period we will have a brief quiz on the projects. You will be expected to remember the major points that were presented about each project, and to evaluate the pluses and minuses of the project method and design. It is worth 5% of your grade.