

Ergonomics (PSY 234) 1 credit
Fall 2009 (R 4:00– 4:50)

Instructor: Dr. Kerrie Baker
Phone: (610) 606-4666, ext. 3426
Office Hours: W 10:00- 11:00 and by appt.

Room: 120 Curtis Hall
E-Mail: kqbaker@cedarcrest.edu

Description: This course will introduce students to the area of “Human Factors”, which applies knowledge of human behavior, abilities, and attributes to the design of tools, equipment, and large-scale systems (e.g., cars, kitchens) for human use. Psychologists in this growing area aim to solve “real-world” problems by improving the usability, efficiency, comfort, and safety of various products. Assignments provide hands-on analysis and discussion for design improvement.

Required Book:

Normal, D.A. (2002). *The Design of Everyday Things*. New York, NY: Basic Books.

Course Objective: The objective of this course is to introduce the basic concepts of ergonomics and to develop an understanding of the importance of considering human capabilities, limits, and preferences in system design. Case studies will be used to understand how people contribute to accidents and to improve designs.

Course Outcomes: 1) Sensitivity to human capabilities and their implications for system performance. 2) Knowledge regarding human limits, and tendencies relevant for design. 3) Appreciation of how human factors can influence the design and resulting effectiveness of human-system interactions. 4) Critical thinking skills to understand the designer and user of a product or system.

Academic Conduct: All Cedar Crest College students are expected to be familiar with and fully supportive of the college’s policy regarding the honor code and academic integrity (e.g., cheating on assignments, copying other students’ work, plagiarism). Any violation will be dealt with according to CCC procedure. Also, appropriate classroom behavior, free from distraction (e.g., late arrivals, early departures, inappropriate conversation), is expected. Care must be taken to protect the rights of all students and faculty to enjoy a courteous, respectful classroom environment. See CCC’s Student Guide for more information regarding the enforcement of these policies. Students with documented disabilities who may need academic accommodations should discuss these needs with me during the first two weeks of class. Students with disabilities who wish to request accommodations should contact the Advising Center.

Psychology Department Attendance Policy: The Psychology Department is committed to the principle that regular and punctual class attendance is essential to the students’ optimum learning and successful academic achievement. Regular class attendance is a student obligation, and students are responsible for all work, tests and written assignments. Therefore, students are expected to be present for all class sessions. The Psychology Department’s attendance policy recognizes that there will be times when attendance at class is not possible. You may think of the policy as being similar to the type used in the corporate world where each employee is given a certain number of

“personal/sick days.” Based on the number of regularly scheduled class meetings, you will be allowed a certain number of absences (see below) with no consequences, no questions asked. In other words, there is no distinction between excused and unexcused absences. You are of course responsible for anything covered during those missed classes, and for submitting assignments on time, regardless of whether or not you attend. Beyond the allowable number of absences, there are consequences that will adversely impact your grade, much as missing too many days of work can adversely impact your employment status. Above all else, you should carefully consider each decision to not attend class, as once your allotted absences have been used, they are gone. It is important that students arrive for class on time. Late arrivals are very distracting, not only to the instructor, but also to fellow students. Repeated late arrivals are not acceptable and will be addressed on an individual basis. It is each student’s responsibility to understand this policy and to keep track of absences throughout the semester.

Application to this Class: Formal attendance will be taken during all class sessions. This class meets once per week (14 class meetings). As such, you may miss **2 classes** without penalty. If you miss **3 classes**, your final grade (cumulative percentage of points) will be lowered by 5%. That means that if you have earned 84% of the available points in the class, which is a B grade, you would be lowered to 79%, which is a C+. Likewise, if you have earned 77% of the points available, the penalty would take you down to 72%, which is a C-. As a reminder, a C grade (73%) is required in all Psychology courses. If you miss **4 classes**, you will receive a failing grade for the course. If you miss four classes, you have missed approximately 25% of the class meetings.

Participation:

One mark of an educated person is an ability to engage in informed, well-reasoned, and open-minded discussions of significant issues. **Prior to each class meeting**, you are expected to read all of the assigned material. Because of the small class size, everyone must attend and **participate intelligently and frequently** in class discussions and activities. Your participation will be evaluated, not on the quantity of what you say, but on the **quality** of your contribution to class discussion.

Assignments: You will be given 3 assignments to analyze and apply the reading and class material. All assignments and activities must be turned in (or take place) **on time** to receive full credit. Late assignments will be penalized 10 points for each day after the due date.

1) (Case Studies) You will be given 2 case studies (1 for our case study discussion day, and 1 for another topic day). Case studies from *The Atomic Chef* (Casey, 2006) provide the basis for class discussions of how ergonomic principles can be applied to real systems. Before class, you should: a) read the specified case, b) write a short (100-200 word) summary of the accident(s), c) list at least 2 causes of the accident, and d) describe at least 2 ways to design the system to avoid the accident. Turn in this summary at the beginning of class on the specified date (1 page; typed and double-spaced). You will present this information to the class.

2) (Error Assignment) Norman’s Chapter 5 describes the following taxonomy of human errors: a) capture errors; b) description errors; c) data-driven errors; d) associative activation errors; e) loss-of-activation errors (lapses); and f) mode errors. For 2 weeks, observe the errors that will inevitably creep into your life. Choose 3 of these errors (only 1 of each type). These errors could occur with 1 product or system,

or 3 different products or systems. Write a short description of each error that occurs, including its classification according to the taxonomy described above and what design changes you would recommend to the product (or system) to prevent the error in the future. Base these design recommendations on the discussion of error remediation in Norman's chapter 5. You should turn in two typed, double-spaced pages (including pictures or sketches).

3) (Future Design Project) We are in for confusing times and exciting times, dangerous times and enjoyable times. The success of the times will depend on the design of future things. Smart technologies are being created right now to enhance pleasure, simplify lives, and add to our safety. If only they could really work flawlessly; if only we could learn how to use them. Your project requires you to perform a high-level ergonomics analysis of a current system (tool, product) of your choosing and use your results to design a smart machine of the future that is user-friendly and elicits positive emotions.

- Describe the current system, in terms of its design strengths and weaknesses based on the principles discussed in class. Be very specific.
- Describe the new, improved smart machine of the future. Again, be very specific. Be sure to show your understanding of the design concepts you use; don't just list them but explain and apply them.

Notes: You should choose a system that you've actually used or interacted with in the past. You may ask different users (not people in this class) to try your system and tell you what they like and do not like (without giving them your perspective first). You must reference any web sources if used (pictures, articles, etc.). You must prepare a picture since a "before design" and "after redesign" sketch is worth a thousand words. Turn in no more than 4 typed, double-spaced pages (including pictures or sketches). You must present your design project to the class; otherwise, 15 points will be deducted.

Student Evaluation: Your grade in this course will be based on the following items and 100 total point allocation:

Participation	10 points	
Case Studies	20 points	(10 for each, total of 2)
Unfindable Object	5 points	
Lego Project	5 points	
Error Assignment	20 points	
Future Design Project	40 points	

The final letter grade will be assigned according to CCC's protocol:

A	93.0-100%	C	73.0-76.6%
A-	90.0-92.9%	C-	70.0-72.9%
B+	86.7-89.9%	D+	67.0-69.9%
B	83.4-86.6%	D	66.9-60%
B-	80.0-83.3%	F	below 60%
C+	76.7-79.9%		

Note: You must get a grade of C or better in this course to have the course count for the Psychology major or minor.

<i>Date</i>	<i>Topic</i>	<i>Chapter</i>
8/27	Introduction	
9/3	The Psychopathology of Everyday Things	1
9/10	The Psychology of Everyday Actions	2
9/17	Knowledge in the Head and in the World	3
9/24	Knowledge in the Head and in the World	3
10/1	Case Study Discussions (in class) and Own Unfindable Object	
10/8	Knowing What to Do	4
10/15	To Err is Human Error Assignment (due 10/29)	5
10/22	The Multiple Faces of Emotion and Design	
10/29	The Multiple Faces of Emotion and Design	
11/5	The Design Challenge & User-Centered Design	6 & 7
11/12	Presentation of Future Design Projects (in class)	
11/19	NO CLASS	
11/26	NO CLASS- - THANKSGIVING HOLIDAY	
12/3	Presentation of Future Design Projects (in class)	