

# Special Topics: Human Factors in Design

## ST-HU FAC DESIGN

PSY 710 X Sec. 004, Spring Term 2008

**Led by: Mike S. WOGALTER**  
**Tuesdays 1:30 - 4:15 pm**  
**Room: POE 724**  
**3 Credit Hours**

### ***Instructor Information***

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### ***Course Objectives***

Human Factors and Ergonomics (HFE) is intimately tied to design. A fundamental goal of HFE is to produce a good fit of products, equipment, environments, and tasks with people. Design should consider people's abilities and limitations in the development and evolution of things. This course will explore ways that HFE can contribute to design particularly in development and testing. A specific emphasis will be on information design, particularly on ways to convey information quickly, accurately, and meaningfully — including graphic displays of quantitative information, symbols to convey concepts, and emergent features. Secondary emphases will include consumer-product and environmental design. This is a seminar course in which class time will be spent discussing the readings assigned for that week. Students will lead certain classes. Students will bring in questions and comments concerning the readings to prompt class discussion. A manuscript on new data collected during the semester related to design completes the course.

### ***Readings***

There are 4 books we will be using:

Few, S. (2004). *Show me the numbers: Designing tables and graphs to enlighten*. Oakland, CA: Analytics Press. ISBN: 0970601999

Lidwell, W., Holden, K., & Butler, J. (2005). *Universal principles in design: A cross-disciplinary reference*. Gloucester, MA: Rockport Publishing. ISBN: 1592530079

Petroski, H. (1996). *Invention by design: How engineers get from thought to thing*. Harvard University Press. ISBN: 0674-46368-4

Weber, R. J. (1992). *Forks, phonographs, and hot air balloons: A field guide to inventive thinking*. Oxford University Press. ISBN: 019506402X

Additionally, readings will include primary source materials, i.e., empirical research articles. Students in the course will assist in choosing the specific articles; they will be determined later.

### ***Prerequisites***

Graduate student status in a masters or Ph.D. program at NC State: This course is mainly geared to Human Factors and Ergonomics graduate students, but graduate students in design, education, technical communication, industrial engineering, and computer science are welcomed to enroll. Persons outside these areas wishing to enroll should ask the instructor.

This course is a seminar in which class participation through discussion is encouraged.

### ***Class participation***

Because of the nature of the course, i.e., a seminar, your participation in class is essential. You should be prepared to speak up and add to each meeting's discussion. Class participation will be worth 20% of the final course grade. Also, see "Attendance policy" below.

You are strongly encouraged to critically read the assigned readings twice: Once before making up questions (discussed below) and again before coming to class. It is recommended that you take handwritten notes (and comments) about the articles as you go through them. Review them before coming to class. Remember to bring the articles for that week to class.

### ***Leader assignments***

Students will be responsible for leading discussion of four sessions during the semester (two concerning the text and two concerning the empirical articles). Leaders will summarize the readings and use the questions/comments from class members to enhance high quality discussion. Leaders should become "experts" regarding the text readings and articles in their assigned sections. Leaders might want to use visual aids (e.g., overheads and hand-outs) to assist in presentation or to search for other source materials to develop better, more informative discussions. The quality of the presentations and discussion leadership will account for 40% of the final course grade (10% per session). Leaders are responsible in making sure that the discussion is fruitful and well paced. There will be a 10 minute break near the midpoint of each class meeting.

### ***Discussion questions***

Each person is required to bring in a set of questions and substantial discussion comments about the readings of that week. It is your chance to find out answers and impressions from peer classmates. The questions/comments should deal with aspects of the texts and articles that you do not understand and need clarification, or simply to stimulate discussion, etc. The quality and regularity of stimulating relevant discussion will be counted in as part of the class participation percentage. Failure to ask questions or make comments will result in a penalty that will depend on such things as the frequency of the problem, etc.

### ***Written research project***

Students are required to complete a written research project on a topic that has the instructor's approval. The project can be focused on any area of scientific merit with respect to the human factors in design. Students are encouraged to include newly-collected or already-collected data in their paper. Papers should be word processed in the format directed by the *Human Factors Author's Guide* (downloadable at WWW.HFES.org) or the *Publication Manual of the American Psychological Association*. The written report should contain a title

page, abstract, review of relevant literature (related to the problem being addressed, purpose of the research (and the reasoning behind it), method (description of the materials and procedure), results (expected or found), discussion/implications of the research, and references, i.e., comparable in form to the papers read in the class). The report should be no longer than 10-12 double-spaced pages of text (excluding supporting figures and tables). Other kinds of projects may be acceptable and will require approval of the instructor. A written proposal (only a half page to a page is necessary) should be submitted by **Feb 12**. Please make one or two appointments to talk to the instructor before submitting a proposal. The discussion will generate potential ideas for do-able research given the time constraint of one semester to start and complete the work. The proposal is worth 5% of the course grade. The final written portion of the assignment will be worth 35% and is due on **April 25**.

### *Attendance Policy*

Students will be expected to attend every class meeting. Missing a single class is like missing a week's worth of classes. Student attendance is important because seminar discussions are only as good as the people who attend and participate. Therefore, students should note that 20% of the course grade is allocated to class participation. Obviously, it is difficult to participate when you are not present. Additionally, with three unexcused absences there will be an automatic penalty of 5% subtracted from the percentage total of the course grade. Each additional missed meeting will result in further reductions of 5% from your final grade. Take the necessary precautions to avoid being in the position to miss a class without a really good excuse.

### *Grading*

All students are expected to do and turn in their own work. Academic integrity is expected. Dishonorable behavior will not be tolerated and when necessary will be pursued through the University's judicial channels.

The grading scale is shown below:

98-100	A+
92-97.9	A
90-91.9	A-
88-89.9	B+
82-87.9	B
80-81.9	B-
78-79.9	C+
72-77.9	C
70-71.9	C-
Less than 70%	F

A summary of the percentage worth of each of the course components follows:

Discussion Leadership	40%
Class participation (including weekly questions/comments)	20%
Project proposal	5%
<u>Written research project</u>	<u>35%</u>
<b>TOTAL</b>	<b>100%</b>

# Calendar for Human Factors in Design Seminar

## *Book Materials*

## *Empirical (Primary-Source) Articles*

<b>Jan 15</b> — <i>Course Introduction</i>	<i>Mike</i>	
<b>Jan 22</b> — <i>Lidwell et al., pp. 1 - 71</i>	<i>Mike</i>	
<b>Jan 29</b> — <i>Lidwell et al., pp. 72 -141</i>	<i>David</i>	
<b>Feb 5</b> — <i>Lidwell et al., pp. 142 - 211</i>	<i>Jennifer</i>	
<b>Feb 12</b> — <i>Few, pp. 1 - 54</i>	<i>Jeff</i>	<i>Jennifer</i>
<b>Feb 19</b> — <i>Few, pp. 55 - 116</i>	<i>Kevin</i>	<i>Jeff</i>
<b>Feb 26</b> — <i>Few, pp. 117 - 216</i>	<i>Soyun</i>	<i>Kevin</i>
<b>Mar 11</b> — <i>Few, pp. 217 - 262</i>	<i>Mike</i>	<i>David</i>
<b>Mar 18</b> — <i>Petroski, pp. 1 - 88</i>	<i>Jeff</i>	<i>Jennifer</i>
<b>Mar 25</b> — <i>Petroski, pp. 89 - 159</i>	<i>David</i>	<i>Soyun</i>
<b>Apr 1</b> — <i>Petroski, pp. 160 - 214</i>	<i>Soyun</i>	<i>David</i>
<b>Apr 8</b> — <i>Weber, pp. 1 - 77</i>	<i>Jennifer</i>	<i>Jeff</i>
<b>Apr 15</b> — <i>Weber, pp. 78 - 190</i>	<i>Kevin</i>	<i>Soyun</i>
<b>Apr 22</b> — <i>Weber, pp. 191 - 253</i>	<i>Mike</i>	<i>Kevin</i>