PSY 649 Advanced Engineering Psychology
Spring 2018
4 Credits
Meeting days/times TBD

Instructor
Jason S. McCarley
jason.mccarley@oregonstate.edu
Reed Lodge 211

Office hours TBD and by appointment

Course description
Advanced survey of human information processing and performance in human-technology systems, with attention to theory, methodology, and implications for system analysis and design.

Learning outcomes
Our goal is that at the end of the course, you will be able to:
1. summarize theories and empirical findings on human information processing and performance relevant to the design of human-technology systems,
2. apply your knowledge of psychological theory and data to assess the design of human-technology systems, and to recommend design changes to improve system performance.

Prerequisites
Graduate standing.

Learning resources
We will have one required textbook, Wickens et al. (2013). Additional readings will be drawn from the primary research literature and sometimes the popular media. A tentative list of articles/chapters that we will read and discuss is presented in the calendar below.

Course structure and content
We will spend the first 9 weeks of the term covering topics and readings selected by the instructor. The tenth week of the term will be devoted to presentations from students.

Evaluation of student performance
Your grade for the semester will be based on the average of four equally-weighted components:
1) exams;
2) assignments;
3) an end-of-semester class presentation;
4) a final paper.

The exams will assess learning outcome #1. The assignments, presentation, and final paper will assess outcome #2.

Exams. We will have two mid-term exams, one in the fifth week and one in the ninth week of the semester. Exam format will be short answer. The second exam will be implicitly cumulative, that is, questions will not directly test on you the material that was covered for the first exam, but may expect you to draw on that knowledge.
Assignments. Twice in the semester, you will be assigned exercises that ask you to apply methods of human performance analysis under discussion in class. In each case, I will provide you a set of simulated data and ask you analyze as you would in a study of a real-world human-technology system. Assignments will be posted to Canvas, and your responses will be uploaded and submitted to Canvas as PDF documents. You will have one week to complete each assignment. Late assignments will be penalized 5% of their point value per day that they are past due.

Class presentation. The last week of the semester will be dedicated to student presentations. These are meant as an opportunity for you to choose a real-world human-technology system, analyze it using the principles and methods discussed throughout the semester, and provide an overview of your analysis to the class. We will allow 30 minutes for each presentation, including 20-25 minutes for the presentation itself and 5 – 10 minutes for questions. In your presentation, you should briefly introduce the system you are discussing and explain its purpose, then analyze and critique it using your knowledge of engineering psychology. Your critique should be supported with explicit reference to principles and findings that were covered throughout the semester, or which you have identified in your own readings on engineering psych. Where you identify flaws or poor design choices, you should recommend corrections, again with reference to specific principles and findings. Presentations will be graded on content, organization, and delivery.

Paper. You will also write a short paper on the topic of your class presentation. This paper should be 2000-2500 words in length, and should summarize your system analysis/critique. As with your presentation, your paper should support its claims with explicit reference to principles and empirical findings covered in the course.

The paper should be submitted as a PDF, in APA format. Papers will be graded on content, organization, and mechanics, with all three components weighted equally. Your paper will be due by 5:00 PM the Monday of finals week. More details on the paper requirements will be provide later in the semester.

Letter grades will be assigned using the scale below:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
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<tbody>
<tr>
<td>92.5–100%</td>
<td>A</td>
</tr>
<tr>
<td>90 up to 92.5%</td>
<td>A-</td>
</tr>
<tr>
<td>87.5 up to 90%</td>
<td>B+</td>
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<tr>
<td>82.5 up to 87.5%</td>
<td>B</td>
</tr>
<tr>
<td>77.5 up to 80%</td>
<td>B-</td>
</tr>
<tr>
<td>72.5 up to 77.5%</td>
<td>C</td>
</tr>
<tr>
<td>70 up to 72.5%</td>
<td>C-</td>
</tr>
<tr>
<td>67.5 up to 70%</td>
<td>D+</td>
</tr>
<tr>
<td>62.5 up to 67.5%</td>
<td>D</td>
</tr>
<tr>
<td>Less than 60%</td>
<td>F</td>
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Attendance policy

You will not be graded directly on attendance. However, lectures and class discussions are likely to include a substantial amount of material from outside the text, and knowledge of that material will be necessary to complete the assignments and to do well on the exams. Consistent attendance is therefore encouraged.

Make-up exams will be allowed only in cases where, A) I am notified in advance that you will be absent for the normally scheduled test for a university-approved reason and we agree to an alternative test time, or B) you provide documentation (e.g., note from a doctor) that an emergency prevented you from taking the normally scheduled test.
**Academic Integrity**

Students are expected to adhere to the highest standards of academic conduct. The University defines academic dishonesty as, “an intentional act of deception in which a student seeks to claim credit for the work or effort of another person or uses unauthorized materials or fabricated information in any academic work.” This is interpreted to cover five categories of behavior: cheating, fabricating information, assisting someone else to carry out academic misconduct, altering or interfering with evaluations or materials, and plagiarizing (http://studentlife.oregonstate.edu/studentconduct/academic-misconduct-reporting-forms).

What all of that means in this course, roughly, is that we will expect students to perform their own work on various assessments, not to disrupt class or assessments, and to give appropriate credit when presenting other people’s words or thoughts. Violations will lead to an academic misconduct report. At a minimum, a student found to have violated standards of academic honesty will lose all credit for the assessment on which the violation occurred.

For more detailed information on the University’s expectations, policies, and procedures pertaining to student conduct, please see:

- http://studentlife.oregonstate.edu/studentconduct/offenses-0
- http://guides.library.oregonstate.edu/subject-guide/1771-Academic-Integrity-for-Students

**Statement Regarding Students with Disabilities**

Accommodations for students with disabilities are determined and approved by Disability Access Services (DAS). If you, as a student, believe you are eligible for accommodations but have not obtained approval please contact DAS immediately at 541-737-4098 or at http://ds.oregonstate.edu. DAS notifies students and faculty members of approved academic accommodations and coordinates implementation of those accommodations. While not required, students and faculty members are encouraged to discuss details of the implementation of individual accommodations.

**Calendar**

Here is a tentative calendar and list of readings we will cover. Note that this is subject to change. Changes to the assigned readings will be announced at least one week before the due date.

**Week 1 Introduction to Engineering Psychology**

Wickens et al. (2013), Chapter 1.


**Week 2 Signal detection and information theory**

Wickens et al. (2013), Chapter 2


∗Assignment 1: Analysis of signal detection data

**Week 3 Attention**

Wickens et al. (2013), Chapter 3
Week 4 Spatial displays and spatial cognition
Wickens et al. (2013), Chapters 4 and 5

Week 5
Review + EXAM 1

Week 6 Language, communication, and symbolic displays
Wickens et al. (2013), Chapter 6

Week 7 Memory and training
Wickens et al. (2013), Chapter 7

Week 8 Mental workload and human-automation interaction
Wickens et al. (2013), Chapters 11 and 12
* Assignment 2: Analysis of mental workload

Week 9
Review + EXAM 2

Week 10
Class presentations