

## IND E 549A / ENVH 549A – Human Factors in Engineering Design

### “Research Methods in Human Factors”

Autumn 2019

<b>Class Meeting:</b>	TTh 2:30 pm – 3:50 pm (3 credits)	LOW 112
<b>Instructor:</b>	Ji-Eun Kim, Ph.D.	Email: jikim@uw.edu
<b>Office Hours:</b>	TTh 4:00 – 5:00 pm	AERB 141A

**Course Description:** The objective of this course is to provide students with the principles of human factors engineering, and the research tools that are used to examine these principles. The class will showcase (through weekly journal article readings) the value of qualitative (e.g., focus groups, interviews) and quantitative (e.g., controlled A/B testing, design of experiments) methods for human factors research. That is, how to capture abstract thoughts, people's opinions, and trends as well as design studies to capture the impact of design changes and interventions more formally. The focus of the class is centered on human factors design principles for safety, productivity, functionality, and usability. Upon course completion, students will be able to begin fundamental research in human factors. The journal articles will cover research methods and design issues related to operator performance given functional, psychological, physiological, and environmental constraints.

**Grading Policy:** Students will be expected to fully participate in class discussions and activities. Grades will be based on such class-participation, as well as on performance in conducting weekly assignments, midterm, paper presentation, and final project.

Weekly critiques (individual)	15 %
Midterm	20 %
Class discussions/participation	5 %
Paper presentation (group)	10 %
Final project (group)	50%
(Part I 10%, Part II 5 %, Part III 10%, Presentation 10%, Final Paper 15%)	

#### **Required Text:**

- Readings assembled by instructor (on course website)
- Recommended textbook: Designing for People: An Introduction to Human Factors Engineering, 3rd edition., Lee et al.

**Prerequisites / Corequisites:** There are no prerequisites or corequisites for this class. However, an introductory class in Human Factors would be useful. Some of the concepts from the introductory class will be presented at a high level in this graduate level course.

**Midterm:** There is one midterm in this class. The midterm will be take-home in the week of Oct 29.

**Weekly Readings and Critiques:** Students are expected to read the material before class. There is a weekly assignment that includes a write-up of the journal article that was assigned for discussion that week; You will submit a one-page critique for one of the assigned papers. The critiques are worth 5 pts each. Do not merely copy the abstract, introduction or conclusion of the papers, you need to add value and insight beyond what is in the paper. A good critique:

- Describes the research problem being addressed and existing approaches (in your own words) (1 pt)
- Explains the general approach the authors used to address the problem (1 pt)
- Critically analyzes and questions the data, results and methods used (1 pt)
- Discusses supplemental or follow-up research that might be pursued in the future (1pt)

**CANVAS:** All information pertinent to this course can be found in CANVAS. Lecture notes and assignments will all be posted here. You are responsible to visit the course website frequently for any announcement and updates.

**Accommodations for Disabilities:** Under the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973, instructors must make reasonable accommodations for students who have physical, mental, or learning disabilities. Therefore, if you require seating modifications or testing accommodations or accommodations of other class requirements, please let me know so that appropriate arrangements may be made.

**Academic Honesty:** Students will be held to the highest standards of academic honesty. There are specific actions that are considered academic dishonesty, cheating or fraud. Detailed information is available at: <https://depts.washington.edu/grading/pdf/AcademicResponsibility.pdf>

**Tentative Course Outline** (Any necessary changes will be announced in class and posted on the website)  
 Critiques are due at 2 pm on the Thursday listed before class. \* Journal articles to be presented by students

Week	Topic	Readings	Assignments
1 9/26	Intro to Human Factors Engineering	Chap 1. Introduction, <i>Designing for People: An Introduction to Human Factors Engineering</i> , 3rd edition	
2 10/1 10/3	Task Analysis	Militello & Hutton, <i>Ergonomics</i> , 1998	Critique #1 (Due: 10/3)
3 10/8 10/10	Design Methods	Jaspers, <i>IJ of Medical Informatics</i> , 2009	Critique #2 (Due: 10/10)
4 10/15 10/17	Qualitative Methods	Hsieh & Shannon, <i>QualHealthRes</i> , 2005 *Van Dongen et al., <i>BMC</i> , 2016	Critique #3 (Due: 10/17) Project Part I
5 10/22 10/24	Controlled studies	*Strayer et al., <i>Human Factors</i> , 2019	Critique #4 (Due: 10/24)
6 10/29 10/31	Midterm (No class)		
7 11/5 11/7	Observational Methods	*Manser et al., <i>Human Factors</i> , 2013	Critique #5 (Due: 11/7) Project Part II
8 11/12 11/14	Objective vs. Subjective Measures	*He et al., <i>IEEE HMS</i> , 2019	Critique #6 (Due: 11/14)
9 11/19 11/21	Survey Design	*Deb et al., <i>Applied Ergonomics</i> , 2017	Critique #7 (Due: 11/21) Project Part III
10 11/26 11/28	Survey Design (Thanksgiving)	*Loft et al., <i>Human Factors</i> , 2015	Critique #8 (Due: 11/26)
11 12/3 12/5	Project Presentation		
12/10			Final Paper