

## **IHE 7300 – Research Methods in HFE**

### **Course Description**

Introduction to research methods available to human factors engineers. Topics include experimental ethics, experimental methods, non-experimental methods, data analysis, and writing research papers. Students are required to conduct and analyze an experiment.

Offered both face-to-face and online  
Graduate level – 3 credit hours

### **Course Learning Objectives**

Students enrolled in this course will learn to:

- Understanding methodological problems in research involving human participants
- Learn and apply common research methods (i.e., design and conduct controlled and field experiments, collect and analyse data), and interpret the results,
- Writing a manuscript in the APA or IEEE format for submission to a journal or a scientific conference, and delivering an oral presentation

### **Course Learning Outcomes**

Upon successful completion of this course, students can:

- Understanding methodological problems in research involving human participants
- Learn and apply common research methods (i.e., design and conduct controlled and field experiments, collect and analyse data), and interpret the results,
- Writing a manuscript in the APA or IEEE format for submission to a journal or a scientific conference, and delivering an oral presentation

### **Tentative Weekly Schedule**

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|--------|---|--|
| Week 1 | Introduction, course structure, scientific research; ethical conduct of research              | Before the end of the week, consult your thesis advisor re your research topic and identify a conference or journal for submission before end of spring semester. If you don't have a thesis advisor, then the topic for your course project will be assigned by me. Complete CITI training. |
| Week 2 | Literature review; needs statement; hypotheses  | Perform a lit search, write a lit review, generate hypotheses for your study.  |
| Week 3 | Survey of research methods; controlled lab experiments; measurements; validity vs reliability | Design a questionnaire.  |
| Week 4 | Survey methods  | Conduct field observation and collect data.  |
| Week 5 | Experimental design; one way, two way, mixed, nested; sample size; power calculation          | Design an experiment and pilot test it. Draft IRB protocol.  |

Week 6	Abstract; Methods	Refine experimental design. Draft Abstract and Methods.
Week 7	Data analysis; reporting results; discussion	Recruit subjects; collect data.
Week 8	Spring Break	Analyse data
Week 9	Analytical methods	Report results
Week 10	Simulation methods	
Week 11	Results; representation and reporting (HFES Health Care Symposium?)	First draft of manuscript.
Week 12	Discussion; limitations; future research	
Week 13	APA format; IEEE format	Second draft of manuscript
Week 14	Conference proceedings, Posters	Present poster
Week 15	Final oral presentations (conference style)	Formatted manuscript; presentation slides