

CS 498 KA3/KA4: Experimental Methods in HCI and Interactive Technologies

Course Information and Schedule: (Topics, Readings, Homework and Exams)

Instructor: Professor Alex Kirlik, Department of Computer Science (kirlik@illinois.edu).

Course Format: This course has been designed to accommodate students taking it either in synchronous or asynchronous fashion. The lectures will be presented live at the listed course times (Tues/Thurs, 11am – 12:15) on Zoom and students may attend these lectures synchronously. All lectures will be recorded then for download at any time after they have been given for students who wish to view them asynchronously. Additionally, all course resources will be available either directly or by links from this (current) website URL (<https://courses.engr.illinois.edu/cs498ka4/sp2020/>) as a simple and single web address for all information related to the course.

Course Description

This course covers conceiving, designing, performing, analyzing data and reporting the results of experiments and usability/UX tests in HCI and empirically evaluating interactive technologies in engineering generally. Topics include defining research questions, selecting experimental objects, tasks, and participants, the ethical protection of subjects, selecting experimental designs, mitigating threats to validity, the collection and analysis of both qualitative and quantitative data, and reporting experimental research in publications.

Both parametric and nonparametric data analysis are covered, including the most commonly used inferential statistical tests such as repeated- and independent-measures ANOVA, post-hoc Tukey, Wilcoxon, Mann-Whitney, Kruskal-Wallis and others. Statistical material is taught using methods based on mathematical foundations rather than with statistical software languages or packages in order to provide both a rigorous and intuitive understanding to complement the convenience these programming environments provide in research practice. Grades are based on homework and 2 exams. Students taking the graduate (KA4) section of the course will also perform and write a short methodological critique of a recently published HCI research article to also factor into their course grades.

Schedule

1. “E-HCI” (Text) is *Experimental Human-Computer Interaction* by H.K. Purchase, NY: Cambridge University Press (2012). Available as an e-book from the UI library. Note: When readings from this text are specified by a range of numbered sections (e.g., “E-HCI 5.3-5.3.3”), the numbered sections should be read as inclusive - so in this case, the reading assignment begins with reading section 5.3, and ends with reading section 5.3.3, as well as each of the sections in between. If no sections are specified the entire chapter is assumed.
2. “WoK” (Other Reading) is *Ways of Knowing in HCI* (J.S. Olson and W.A. Kellogg, Eds.), NY: Springer (2014). Also available as an e-book from the UI library. Assigned readings are indicated by chapter author names, as the chapters are not numbered.

3. "H1" – "H6" are homework assignments based on statistics, due 1 week after assigned.

Items in **RED font** are due dates for readings to be completed. HWs Due 1 Week after Ass'd.

Weekly Reading, Lecture, Homework and Exam Schedule

AUG	Tuesday	Thursday
1. T 8/25	Course Introduction	
2. R 8/27	Topic Intro	E-HCI: Chap 1
SEPT		
3. 9/1	Concepts, Values, Methods	WoK: Mankoff and Hudson
4. 9/3	Experimental Principles	E-HCI: Chap 8
5. 9/8	Defining the Research I	E-HCI: Chap 2
6. R 9/10	Defining the Research II.	
7. T 9/15	Experimental Procedure	E-HCI: Chap 3
8. R 9/17	Ethics in HCI Research	WoK: Bruckman
9. T 9/22	Data Collect/Qual Analysis	E-HCI: Chap 4
10. R 9/24	Ethnography	WoK: Dourish
11. T 9/29	Statistics 1 (H1 Ass'd): E-HCI 5-5.2.1	
OCT		
12. R 10/1	Using Online Communities	WoK: Terveen
13. T 10/6	Statistics 2 (H2 Ass'd): E-HCI 5.2.2-5.2.3	
14. R 10/8	Exam 1: Covers Material Through Thursday, October 1st	
15. T 10/13	Statistics 3 (H3 Ass'd): E-HCI 5.3-5.3.3	
16. T 10/15	Crowdsourcing Methods	WoK: Egelman
17. T 10/20	Statistics 4 (H4 Assigned): E-HCI 5.4-5.5.1	
18. R 10/22	Social Network Analysis	WoK: Hansen
19. T 10/27	Statistics 5 (H5 Assigned): E-HCI 5.5.2-5.5.2.1	
20. R 10/29	Using Sensor Data Streams	WoK: Volda
NOV		
21. T 11/3	Statistics 6 (H6 Assigned) E-HCI 5.6.-5.8	
22. R 11/5	Survey Research	WoK: Müller
23. T 11/10	Reporting Research <u>E-HCI Ch 6</u>	
24. R 11/12	Eye Tracking Methods	WoK: Navalpakka

25. T 11/17 Course and Exam 2 Review
26. R 11/19 **Exam 2**: Last Day of On-Campus Instruction

Provost Statement on Mental Health:

Diminished mental health, including significant stress, mood changes, excessive worry, substance/alcohol abuse, or problems with eating and/or sleeping can interfere with optimal academic performance, social development, and emotional wellbeing. The University of Illinois offers a variety of confidential services including individual and group counseling, crisis intervention, psychiatric services, and specialized screenings at no additional cost. If you or someone you know experiences any of the above mental health concerns, it is strongly encouraged to contact or visit any of the University's resources provided below. Getting help is a smart and courageous thing to do -- for yourself and for those who care about you.

Counseling Center: 217-333-3704, 610 East John Street Champaign, IL 61820
McKinley Health Center: 217-333-2700, 1109 South Lincoln Avenue, Urbana, Illinois 61801

Grainger College Anti-Racism and Inclusivity Statement for Inclusion in Course Syllabi:

The Grainger College of Engineering is committed to the creation of an anti-racist, inclusive community that welcomes diversity along a number of dimensions, including, but not limited to, race, ethnicity and national origins, gender and gender identity, sexuality, disability status, class, age, or religious beliefs. The College recognizes that we are learning together in the midst of the Black Lives Matter movement, that Black, Hispanic, and Indigenous voices and contributions have largely either been excluded from, or not recognized in, science and engineering, and that both overt racism and micro-aggressions threaten the well-being of our students and our university community.

The effectiveness of this course is dependent upon each of us to create a safe and encouraging learning environment that allows for the open exchange of ideas while also ensuring equitable opportunities and respect for all of us. Everyone is expected to help establish and maintain an environment where students, staff, and faculty can contribute without fear of personal ridicule, or intolerant or offensive language. If you witness or experience racism, discrimination, micro-aggressions, or other offensive behavior, you are encouraged to bring this to the attention of the course director if you feel comfortable. You can also report these behaviors to the Bias Assessment and Response Team (BART) (<https://bart.illinois.edu/>). Based on your report, BART members will follow up and reach out to students to make sure they have the support they need to be healthy and safe. If the reported behavior also violates university policy, staff in the Office for Student Conflict Resolution may respond as well and will take appropriate action.

UI and Grainger College Statements relevant to all courses offered in Fall 2020:

Sexual Misconduct Reporting Obligation

The University of Illinois is committed to combating sexual misconduct. Faculty and staff members are required to report any instances of sexual misconduct to the University's Title IX Office. In turn, an individual with the Title IX Office will provide information about rights and options, including accommodations, support services, the campus disciplinary process, and law enforcement options.

A list of the designated University employees who, as counselors, confidential advisors, and medical professionals, do not have this reporting responsibility and can maintain confidentiality, can be found here: wecare.illinois.edu/resources/students/#confidential.

Other information about resources and reporting is available here: wecare.illinois.edu.

Academic Integrity

The University of Illinois at Urbana-Champaign Student Code should also be considered as a part of this syllabus. Students should pay particular attention to Article 1, Part 4: Academic Integrity. Read the Code at the following URL: <http://studentcode.illinois.edu/>.

Academic dishonesty may result in a failing grade. Every student is expected to review and abide by the Academic Integrity Policy: <https://studentcode.illinois.edu/article1/part4/1-401/>. Ignorance is not an excuse for any academic dishonesty. It is your responsibility to read this policy to avoid any misunderstanding. Do not hesitate to ask the instructor(s) if you are ever in doubt about what constitutes plagiarism, cheating, or any other breach of academic integrity.

Religious Observances

Illinois law requires the University to reasonably accommodate its students' religious beliefs, observances, and practices in regard to admissions, class attendance, and the scheduling of examinations and work requirements. You should examine this syllabus at the beginning of the semester for potential conflicts between course deadlines and any of your religious observances. If a conflict exists, you should notify your instructor of the conflict and follow the procedure at <https://odos.illinois.edu/community-of-care/resources/students/religious-observances/> to request appropriate accommodations. This should be done in the first two weeks of classes.

Disability-Related Accommodations

To obtain disability-related academic adjustments and/or auxiliary aids, students with disabilities must contact the course instructor and the Disability Resources and Educational Services (DRES) as soon as possible. To contact DRES, you may visit 1207 S. Oak St., Champaign, call 333-4603, e-mail disability@illinois.edu or go to <https://www.disability.illinois.edu>. If you are concerned you have a disability-related condition that is impacting your academic progress, there are academic screening appointments available that can help diagnosis a previously undiagnosed disability. You may access these by visiting the DRES website and selecting "Request an Academic Screening" at the bottom of the page.

Family Educational Rights and Privacy Act (FERPA)

Any student who has suppressed their directory information pursuant to Family Educational Rights and Privacy Act (FERPA) should self-identify to the instructor to ensure protection of the privacy of their attendance in this course. See <https://registrar.illinois.edu/academic-records/ferpa/> for more information on FERPA.