



CS-770[†] Human-Computer Interaction, *Fall 2021*

OVERVIEW

CREDITS

This is a three-credit course.

CANVAS COURSE URL

<https://canvas.wisc.edu/courses/271494>

COURSE WEBSITE

<https://wisc-hci-curriculum.github.io/cs770-f21/>

COURSE PIAZZA URL

<http://piazza.com/wisc/fall2021/compsci770001/home>

COURSE DESIGNATIONS AND ATTRIBUTES

Graduate course in computer science, psychology, and educational psychology

MEETING TIME AND LOCATION

TR 1:00–2:15 pm Online (Zoom, accessed through Canvas)

INSTRUCTIONAL MODE

Online

SPECIFY HOW CREDIT HOURS ARE MET BY THE COURSE

The credit standard for this course is met by an expectation of a total of 135 hours of student engagement with the course learning activities (at least 45 hours per credit), which include regularly scheduled instructor-student meeting times (during class), reading, writing, problem sets, studio time, labs, field trips, and other student work as described in the syllabus.

COURSE DESCRIPTION

This course is designed to introduce graduate students in computer science, psychology, educational psychology, and other disciplines research topics, principles, and research methods in human-computer interaction (HCI), an interdisciplinary area concerned with the study of the interaction between humans and interactive computing systems. Research in HCI looks at major social, cognitive, and physical phenomena surrounding human use of computers with the goal of

[†] Cross-listed as Psych/EdPsych-770

understanding their impact and creating guidelines for the design and evaluation of software and physical products and services in industry.

The course consists of three modules: (1) **seminar**, which reviews major research topics in HCI through a set of readings, class presentations, and discussions; (2) **methods**, which covers qualitative and quantitative human-subjects research through lectures, tutorials, hands-on activities, and weekly assignments; and (3) **project**, where students complete a semester-long project, usually involving empirical research, that culminates in the writing of a short paper.

The course is designed primarily for graduate students in computer science, psychology, and educational psychology, however advanced undergraduates (with significant research experience and/or enrolled in the L&S Honors program) in these programs and graduate students from other programs may take the course with the permission of the instructor. Specifically, these students should meet with the instructor after the first class of the semester or during the first office hours of the semester to discuss their enrollment.

REQUISITES

No prerequisites are required to take the course.

INSTRUCTORS AND TEACHING ASSISTANTS

INSTRUCTOR TITLE AND NAME

Professor Bilge Mutlu

INSTRUCTOR AVAILABILITY

During scheduled class hours; during office hours (immediately after class, **Tuesdays 2:15–3:00 pm**); or by appointment.

INSTRUCTOR EMAIL/PREFERRED CONTACT

Preferred contact is instructor office hours or by messaging over Microsoft Teams

TEACHING ASSISTANTS

Dakota Sullivan

TA OFFICE HOURS

Mondays-Wednesdays 3-3:30 pm (Microsoft Teams)

TA EMAIL/PREFERRED CONTACT

Preferred contact is TA office hours or by messaging over Microsoft Teams

LEARNING OUTCOMES

COURSE LEARNING OUTCOMES

Student will be able to:

- Define research questions, construct hypotheses, map out and identify gaps in the research literature, and situate research questions and hypotheses in existing knowledge

- Gain familiarity with seminal research across various topics in human-computer interaction
- Determine the research approach that best fits a research question, identify variables of interest for empirical investigation, and design qualitative, quantitative, and hybrid studies
- Determine appropriate objective, behavioral, physiological, subjective, and composite measures for empirical investigation
- Design survey questions, construct scales, and assess reliability and validity
- Analyze qualitative and quantitative data using grounded theory and statistical methods
- Carry out a project to investigate an original research question in human-computer interaction
- Write an academic paper to report on research design and findings

COURSE TOPICS & SCHEDULE

The table below provides a full list of the topics covered in the seminar and methods modules of the project as well as the assignment and project deliverable schedules. Specific topics and due dates might change during the semester, and students should refer to the version of the topics and schedule on the course website.

| | Date | Seminar | Date | Methods | Assignments | Project |
|------------|-----------------|--------------------------------|------------------|-------------------------------|--------------------|--------------------|
| | <i>Tuesdays</i> | | <i>Thursdays</i> | | <i>Due Fridays</i> | <i>Due Mondays</i> |
| W01 | <i>Sep 7</i> | <i>No class</i> | Sep 9 | Course Introduction | | |
| W02 | Sep 14 | History of HCI | Sep 16 | Introduction | | |
| W03 | Sep 21 | Research Frameworks | Sep 23 | Choosing Methods | | Topic selection |
| W04 | Sep 28 | User Modeling | Sep 30 | Ethnography | | |
| W05 | Oct 5 | Artificial Agents | Oct 7 | Qualitative data analysis | Assignment 1.A | Lit survey, RQ |
| W06 | Oct 12 | CMC | Oct 14 | Experimental design I | Assignment 1.B | |
| W07 | Oct 19 | CSCW | Oct 21 | Experimental design II | | |
| W08 | Oct 26 | Crowdsourcing | Oct 28 | Measurement I | Assignment 2.A | Method |
| W09 | Nov 2 | Educational Technology | Nov 4 | Measurement II | | |
| W10 | Nov 9 | Mobile & Tangible Computing | Nov 11 | Measurement III | | |
| W11 | Nov 16 | Privacy | Nov 18 | Statistics I | Assignment 2.B | |
| W12 | Nov 23 | Programming & Authoring Tools | <i>Nov 25</i> | <i>Thanksgiving, No class</i> | | Data collection |
| W13 | Nov 30 | Physiological Computing | Dec 2 | Statistics II | | |
| W14 | Dec 7 | Assistive Tech & Accessibility | Dec 9 | Statistics III | | Analysis & Results |
| W15 | Dec 14 | Reporting | <i>Dec 16</i> | <i>No class</i> | Assignment 2.C | |
| | | | | | | Final paper |

GRADING

GRADING WEIGHTS

| Assessments | Points |
|---|------------|
| Seminar: Participation in online discussions | 15 |
| Methods: Hands-on activities | 10 |
| Methods: Assignments | 40 |
| Project | 30 |
| General: Attendance, classroom participation | 5 |
| <i>Total</i> | <i>100</i> |

GRADING SCALE

The grading scale will be used as a rough guide to assign final grades, and adjustments will be made to ensure that the grade distribution reflects the general pattern of CS graduate courses. As a rule of thumb, students who make a submission for all required work should expect to get an **A** or an **AB** in class.

| Letter grade | Grade range | Description |
|--------------|-------------|--|
| A | 93.5–100 | Excellent work <i>(Exceeds expectations)</i> |
| AB | 89.5–93.4 | Good work <i>(Robustly meets all stated requirements)</i> |
| B | 83.5–89.4 | Adequate work <i>(Meets the spirit of all stated requirements)</i> |
| BC | 79.5–83.4 | Slightly below adequate <i>(Missing small required elements or turned in late without approved extension)</i> |
| C | 73.5–79.4 | Below adequate <i>(Missing required elements or turned in late without approved extension)</i> |
| D | 73.4–63.5 | Well below adequate <i>(Missing many required elements or turned in late without approved extension)</i> |
| F | 63.5 | Inadequate <i>(Work not turned in, no extension requested)</i> |

COURSE STRUCTURE

MODULE 1: SEMINAR

The **seminar** module of the class will cover principles of and literature in HCI through a set of readings. The list of topics that will be covered in this module are shown in the COURSE TOPICS & SCHEDULE table. A comprehensive list of readings on these topics will be posted on the course website. The first hour of class on Tuesdays will include a brief introduction to that week's topic by the instructor, followed by an extended discussion led by students assigned to serve as moderators. As a preparation for the lecture and discussion, students will be asked to complete an average of three readings for each topic and to write a 250-word essay that discusses one or several of the readings at the beginning of class each week (i.e., a total of 14 essays throughout the semester). Students will sign up to serve as moderators in advance. The essays are due by midnight the day before class and should be submitted to Canvas.

MODULE 2: METHODS

In the **methods** module, a set of human-subjects research methods and procedures commonly used in HCI will be covered through lectures, tutorials, in-class hands-on activities, and weeklong assignments. The first half of class on Tuesdays will be dedicated to lecture, and the remaining class time will be used for Q&A, tutorials, and hands-on activities. The COURSE TOPICS & SCHEDULE table provides a list of the research methods and procedures that will be covered. Students will practice a subset of these methods through five assignments that include writing one-page reports of their process and findings. Students will submit their reports along with supplementary material to Canvas. Additionally, students will work in pairs to complete a graded hands-on assignment during class.

MODULE 3: PROJECT

In the **project** module, students will conduct a semester-long project to explore HCI research in critical and emerging domains of computing. The goals of the project are:

- Completing the required human-subjects research training program and an Institutional Review Board (IRB) application for the project,
- Gaining a theoretical and empirical understanding of the application domain,
- Applying exploratory and experimental research methods in HCI,
- Prototyping user interfaces,
- Designing exploratory and experimental studies,
- Gaining experience in recruiting participants and conducting studies with human subjects,
- Creating generalizable knowledge on how computing can improve aspects of human life.

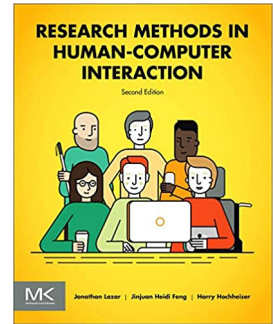
The project module will be completed through a series of deliverables throughout the semester. These deliverables will contribute to a 4–6-page paper in the ACM Proceedings format that will constitute the final project deliverable at the end of the semester. The deliverables will follow the schedule shown in the COURSE TOPICS & SCHEDULE table.

Students will work on projects individually, although project pairs are acceptable. Projects involving pairs should involve substantially more work, clearly indicate individual student contributions, and result in a longer report. The page limit for reports for individual and pair

projects are 4 and 6 pages, respectively. Pair projects will be subject to team grading, such that 20% of the project grade will be determined by teammate evaluations.

REQUIRED TEXTBOOK, SOFTWARE & OTHER COURSE MATERIALS

The instructional content for the **seminar** module will include individual research articles that will be posted by the instructor on the course website. The **methods** module will use [*Research Methods in Human-Computer Interaction*, Second Edition](#), by Jonathan Lazar, Jinjuan Heidi Feng, Harry Hochheiser, Morgan Kaufmann (2017) (digital version freely available through the UW–Madison Library.) Software requirements for assignments will be provided in the assignment handouts. All other materials will be provided by the instructor.



COURSE POLICIES

POLICIES FOR COURSE CONDUCT

Attendance: Students are expected to attend class, arrive on time, participate in group hands-on activities, and offer comments on readings. In addition, students are expected to offer feedback on and suggestions to improve their classmates' work. If a student needs to miss a class, he/she should inform the TA ahead of time email to hci-class@cs.wisc.edu.

Late Policy: Assignments and project deliverables that are not submitted by the due date will lose 20% of the total grade for that deliverable for each day that the assignment is late.

Emergencies and Exceptions: Inform the instructor immediately by emailing hci-class@cs.wisc.edu of any crisis that preclude you from attending a class or an exam.

Special Needs: Students with special needs should inform the instructor immediately via email so that accommodations can be made.

Religious observances: Let the instructor know well in advance if an assignment, deadline, or major project milestone interferes with an important religious or cultural observance/event.

Communication: All class material, including assignment handouts, readings, supplemental materials, and pointers to other resources, will be available on or linked through the course website. All questions regarding assignments, code/analysis, deadline, or expectations that is of interest to all students should be posted on the course Piazza. All communication on individual matters must be done via email through the hci-class@cs.wisc.edu address. Please do not email the instructor or the TA directly. Announcement will be made via Canvas, so students should configure their notification settings to receive announcements in a timely manner.

Office Hours: Office hours are the best time to get feedback from the instructor on assignments and projects. Other questions, concerns, individual issues, and team communication problems

can be discussed by appointment. The instructor will also be available for questions via email anytime and phone during work hours.

Classroom recording: Because pictures and videos we present in class can be copyright-protected or subject to human-subjects protection, no student may record or tape any classroom activity without the express written consent of the instructor. If a student has a disability that requires him/her to record or tape classroom activities, he/she should contact the [UW-Madison McBurney Disability Resource Center](#) to arrange an appropriate accommodation.

RULES, RIGHTS & RESPONSIBILITIES

See the Guide's to Rules, Rights and Responsibilities at <http://guide.wisc.edu/undergraduate/#rulesrightsandresponsibilitiestext>.

ACADEMIC INTEGRITY

By enrolling in this course, each student assumes the responsibilities of an active participant in UW-Madison's community of scholars in which everyone's academic work and behavior are held to the highest academic integrity standards. Academic misconduct compromises the integrity of the university. Cheating, fabrication, plagiarism, unauthorized collaboration, and helping others commit these acts are examples of academic misconduct, which can result in disciplinary action. This includes but is not limited to failure on the assignment/course, disciplinary probation, or suspension. Substantial or repeated cases of misconduct will be forwarded to the Office of Student Conduct & Community Standards for additional review. For more information, refer to <https://conduct.students.wisc.edu/academic-integrity/>.

ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES

McBurney Disability Resource Center syllabus statement: The University of Wisconsin-Madison supports the right of all enrolled students to a full and equal educational opportunity. The Americans with Disabilities Act (ADA), Wisconsin State Statute (36.12), and UW-Madison policy (Faculty Document 1071) require that students with disabilities be reasonably accommodated in instruction and campus life. Reasonable accommodations for students with disabilities is a shared faculty and student responsibility. Students are expected to inform the instructor of their need for instructional accommodations by the end of the third week of the semester, or as soon as possible after a disability has been incurred or recognized. The instructor will work either directly with the student or in coordination with the McBurney Center to identify and provide reasonable instructional accommodations. Disability information, including instructional accommodations as part of a student's educational record, is confidential and protected under FERPA. In addition to completing an electronic Faculty Notification Letter request through McBurney Connect, it is important for students to contact the course instructor directly by the end of the third week of the semester to set up a meeting to discuss implementation of any necessary accommodations. This early communication helps ensure that accommodations can be implemented in a timely manner. For example, if an alternative exam room is needed, arrangements must be made well in advance of an exam date to ensure room availability and to secure a room booking. <https://mcburney.wisc.edu>

Additional disability statement: In addition to completing an electronic Faculty Notification Letter request through McBurney Connect, it is important for students to contact the course instructor directly by the end of the third week of the semester to set up a meeting to discuss implementation of any necessary accommodations. This early communication helps ensure that accommodations can be implemented in a timely manner. For example, if an alternative exam room is needed, arrangements must be made well in advance of an exam date to ensure room availability and to secure a room booking.

DIVERSITY & INCLUSION

Institutional statement on diversity: Diversity is a source of strength, creativity, and innovation for UW-Madison. We value the contributions of each person and respect the profound ways their identity, culture, background, experience, status, abilities, and opinion enrich the university community. We commit ourselves to the pursuit of excellence in teaching, research, outreach, and diversity as inextricably linked goals. The University of Wisconsin-Madison fulfills its public mission by creating a welcoming and inclusive community for people from every background – people who as students, faculty, and staff serve Wisconsin and the world.

<https://diversity.wisc.edu/>