

I480: EXPERIENCE DESIGN AND EVALUATION OF UBIQUITOUS COMPUTING

Location and Time:

Instructor: Dr. Erin Brady

Contact Information: brady@iupui.edu, IT 591

Office Hours: In person in IT 591, or over phone/Skype/Google Hangouts
Mondays, 1pm to 3pm – drop-in hours
Thursdays, 10am – 12pm – email in advance

COURSE DESCRIPTION

The course focuses on ubiquitous computing and related interface/system design, and user-experience issues. Applications include interactive systems which support natural/gesture/touch-based interactions on devices such as mobile, extra-small-and-large displays, and other non-traditional pervasive technologies. Projects include interaction and evaluative techniques: field observation, contextual inquiry, ethnography, survey/interviews, and cognitive walkthrough.

COURSE OUTCOMES

- Become familiar with a variety of high- and low-fidelity prototyping techniques and demonstrate expertise with at least three of these techniques;
- Become familiar with a variety of HCI evaluation techniques and gain experience using them in conjunction with sketches and prototypes of differing fidelity levels;
- Gain experience thinking about the diversity of user experience design challenges posed by the ubiquitous computing paradigm;
- Build experience and exposure to working as part of a collaborative design team;
- Utilize a breadth of sketching and HCI evaluation techniques in a realistic product design assignment;
- To analyze a design challenge and think systematically about the best combination of prototypes to communicate a single, final design or a number of design alternatives to representative users;
- Understand the purpose and structure of a design critique meeting and have experience presenting and soliciting feedback about their design ideas from others.

TEXTBOOK AND MATERIALS

Required:

- Krumm, John. *Ubiquitous Computing Fundamentals*. Chapman and Hall/CRC Press. ISBN: 978-1420093605.
- A sketchbook

Optional additional text:

- Greenberg, Saul; Carpendale, Sheelagh; Marquardt, Nicolai; and Buxton, Bill. *Sketching User Experiences: The Workbook*. Published by Morgan Kaufmann. ISBN: 978-0123819598.

ASSESSMENTS AND GRADING

ASSESSMENT

Type	Description	% of Final Grade	Format
Attendance and Readings	Weekly reading quiz, in-class	10%	10 quizzes given, lowest score dropped
Class Participation	General participation in class (including constructive participation in critiques)	10%	As evaluated by instructor
Individual Assignments	Weekly sketching/prototyping exercises	25%	Turned in at beginning of the next class after it was assigned. Lowest score dropped
	Individual design project	10%	
Group Project	Group project team sign-ups	5%	Each team grade will be modified by a teamwork score for each individual member
	Fieldwork	10%	
	Design problem writeup	5%	
	Poster presentation	5%	
	Final project presentation	10%	
	Final project portfolio	10%	

ATTENDANCE AND READING QUIZZES

As this course takes place once a week, repeated absences will significantly impact your ability to participate in discussions and learn from the instructor and other students. Attendance will be measured through the in-class reading quizzes, which will cover the material in the readings assigned for the prior week. You may miss two of the quizzes without penalty.

CLASS PARTICIPATION

The instructor expects students to be appropriately prepared for each lecture meeting, to attend all lectures on time, and to conduct themselves in a professional manner.

During the course, students will have multiple opportunities to present and elicit peer feedback on their sketches and prototypes--based on both the weekly design exercises and the individual design project. A significant portion of each student's class participation grade will be determined by their performance in these critique sessions, which will be held at the beginning of class during most weeks of the quarter. When assigned to have their own work reviewed, students are expected to be prepared to provide a brief, professional presentation of their sketches and/or prototypes and to help guide the discussion. Students are also expected to provide thoughtful, respectful, and constructive comments when evaluating others' work.

INDIVIDUAL ASSIGNMENTS

Over the course of the term, students will be introduced to a wide variety of sketching and prototyping techniques. Nearly every lecture meeting will include a hands-on "studio" session focused on developing students' skills with a particular class of design techniques, as well as making them aware of how these techniques might be used to communicate particular aspects of a design.

Each week, students will be expected to complete an individual design exercise, which will give them an additional opportunity to practice applying a sketching or prototyping technique. (Some exercises may be completed in a small group of 2-4 students.) Each of these exercises will address a design challenge from a different sub-area within ubiquitous computing.

The deliverables from these exercises will be due at the beginning of the first class meeting after they are assigned. They will be evaluated primarily on the creativity of thinking represented and the communicative effectiveness of the deliverable; less focus will be placed on the artistic merit of the submissions. The lowest score in the semester will be dropped.

Students will also complete one in-depth design project on their own, where they will explore one of the design challenges from the weekly exercises more deeply and from different perspectives. The outcome from this project will be a more thoughtfully developed ubicomp product or system design, comprising at least 20 sketches or prototypes using at least three of the techniques introduced in the course (e.g., a suite of artifact design sketches, a Foamcore model of the artifact, and a video sketch of how the artifact might be used in a real-world scenario).

GROUP PROJECT:

Students will work in teams of 2-3 to conduct informal, exploratory field work in a broad domain specified by the instructor, develop sketches and prototypes representing a novel ubiquitous computing technology or environment that addresses some well-identified user need, and carry out early-stage evaluations of these sketches and prototypes with representative users.

The main deliverables for the group project are:

- Ethnographic fieldwork to determine a research challenge
- A short presentation and one-page report about the challenge, audience, and design constraints
- Initial design sketches and storyboards, presented in a poster session
- A written evaluation plan detailing the methods used to solicit feedback from representative users
- A final presentation and portfolio of the project
- Peer and self-evaluations of each project component

Each of these components will have a dedicated assignment description released in class when assigned. Team grades will also incorporate a teamwork modified, based on the peer and self-evaluations, which can influence an individual's grade if they contributed more or less than other members.

SCHEDULE

This is a tentative schedule for the course; subject to changes as we progress through the semester.

Date	Week	Topic	Readings Due	Assignments Due
	Week 1	Overview		
NO CLASS - MARTIN LUTHER KING JR DAY				
	Week 2	Introduction and History	UCF 1, Syllabus	Sign up for groups
	Week 3	Ethnography	UCF 5	
	Week 4	UbiComp Systems	UCF 2	Individual Sketches 1, Group Presentations
	Week 5	GUI to UUI	UCF 6	Individual Sketches 2
	Week 6	Methods Session	None	Individual Sketches 3, Group Problem Statements
	Week 7	Location	UCF 7	Individual Sketches 4
	Week 8	Context-Aware Computing	UCF 8	Individual Sketches 5, Group Posters
NO CLASS - SPRING BREAK				
	Week 9	Methods Session	None	Individual Sketches 6
	Week 10	Field Studies 1	UCF 4.1-4.3	Individual Sketches 7
	Week 11	Field Studies 2	UCF 4.4-4.7	Individual Sketches 8
Week 12 - NO CLASS SESSION HELD - Fieldwork				
	Week 13	Privacy 1	UCF 3.1-3.2	Individual Sketches 9, Group Evaluation Plan
	Week 14	Privacy 2	UCF 3.3-3.4	
	Week 15	Final presentations	None	Final Presentations, Portfolios

GRADING POLICIES

GRADING SCALE:

A+	100%	Professional level work, showing highest level of achievement
A	93–99%	Extraordinarily high achievement and quality; shows command of subject matter
A–	90–92%	Excellent and thorough knowledge of the subject matter
B+	87–89%	Above-average understanding of material and quality of work
B	83–86%	Mastery and fulfillment of all course requirements; good, acceptable work
B–	80–82%	Satisfactory quality of work
C+	77–79%	Minimally acceptable performance and quality of work
C	73–76%	Unacceptable work, does not demonstrate mastery
C–	70–72%	Unacceptable work
D+	67–69%	
D	63–66%	
D–	60–62%	
F	Below 60%	

ACADEMIC MISCONDUCT

Academic misconduct is unacceptable within this course. IUPUI defines academic misconduct as cheating, fabrication, facilitating misconduct, interference with another student, plagiarism, and violating course rules. For more about these, please visit: registrar.iupui.edu/misconduct.html

LATE ASSIGNMENTS

Individual assignments will be penalized by -10% for every day past the deadline (e.g., if an individual assignment which was due at 11:59pm Monday is turned in at 12:00pm Tuesday, it can get at highest 90%; if it is turned in at 12:00 Wednesday, it can get at highest 80%, etc).

Quizzes and group assignments will not be accepted late, no exceptions. Partial credit will be given for assignments that are turned in on time, but incomplete; so turn in whatever you have by the deadline.

ACADEMIC WITHDRAWAL

A basic requirement of this course is that students participate in class discussions and conscientiously complete all required course activities and/or assignments. If a student is unable to attend, participate in, or complete an assignment on time, it is the student's responsibility to inform the instructor and make alternative arrangements. If a student **fails to sign up for a group project team on time; does not actively participate in the first phase of the group project; or misses more than half of the points for the reading quizzes and individual assignments within the first 5 weeks of the course without contacting the instructor, the student may be administratively withdrawn.** Administrative withdrawal may have academic, financial, and financial aid implications. Administrative withdrawal will take place after the full refund period, and a student who has been administratively withdrawn from a course is ineligible for a tuition refund.

CLASSROOM POLICIES POLICIES

ACCESSIBILITY AND CLASSROOM INCLUSION

Please approach me in person or by email in the first week of class so we can work together to address any accessibility or inclusion concerns you have. After the first week, it will become difficult to adapt assignments or modify classroom policies. All information we discuss will be handled with discretion.

- **Accessibility and Learning Styles:** If you have any accessibility needs, please contact Adaptive Educational Services (AES) to register them as soon as possible (aes.iupui.edu). AES works with students with documented disabilities to provide accommodations for their educational needs. The course has been designed for multiple different styles of learning. However, if you have any specific learning styles that you want me to know about which would not be addressed by AES, please reach out to me within the first week of class so I can try to accommodate.
- **Religious Observances:** If you require accommodation for religious observances, notify me by the end of the second week of the semester using the Request for Course Accommodation Due to Religious Observance Form (<http://registrar.iupui.edu/religiousholidayform.html>).
- **Personal Information:** If your personal information in the University's system does not reflect you accurately (for example, an alternative name or nickname you go by, preferred pronouns), please email me at any time so I can use the correct information in our communications.

TITLE IX HARASSMENT POLICY

Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses, subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, etc. If you or someone you know has been harassed or assaulted, you can find the appropriate university resources at stopsexualviolence.iu.edu, or contact the Indiana University Police Department at 317-274-7911 or the Indianapolis Metropolitan Police Department at 317-327-3811 or by dialing 911.

CREDITS

This syllabus is derived from Dr. Stephen Volda's syllabus for I480 in Spring 2013, which is available online here: soic.iupui.edu/syllabi/INFO-I480-Stephen_Volda.pdf

Additional topics, readings, and inspiration were drawn from the following courses at other universities:

- Shwetak Patel's CSE590, "Ubiquitous Computing" Spring 2015:
abstract.cs.washington.edu/~shwetak/classes/cse590p