Course Description

This advanced interaction design course focuses on designing interactive applications for emerging mobile and context-aware technologies. It follows a similar format to 582 (Interaction Design) in that course is studio-based, consists largely of a seminar-long group project with multiple milestones, and is supplemented by readings and discussion relevant to the topic. Class meetings consist of brief lectures to introduce and frame course concepts, design methods, and technical tools; discussion of readings; in-class design exercises; and group work/lab time. Some programming will be required in order to complete prototyping activities, though students have flexibility in choosing the platforms and languages used. Programming will not be taught in the course. Credit Hours: 3

Advisory prerequisites: SI 622, Required prerequisites: SI 582

Contact Information and Office Hours

Office Hours on Zoom*
by appointment with Calendly*

Lectures on Zoom*
Wednesdays 5:30 - 8:30 pm

Office Hours on Zoom*
by appointment with Calendly*

* see Canvas https://umich.instructure.com/courses/433745 for Zoom & Calendly links. Because the syllabus is published on the UMSI website, the link is not published here to help avoid Zoombombings.
Course Learning Goals

After taking this course, students will:

- be able to identify methods and techniques to convey ‘Design Future’ concepts as they relate to Pervasive Computing
- be skilled at applying several methods and techniques to develop these ‘Design Future’ concepts
- be able to extend existing Pervasive Design (Ubiquitous Computing) contributions and use this literature alongside research from CHI and CSCW to support their work

Course Learning Objectives

| Knowledge | • What is Pervasive Computing (UbiComp)?
|           | • What is Pervasive Interaction Design?
|           | • Understand the role of sensors, microprocessors, actuators, AI and machine learning in designing novel pervasive applications
|           | • Become familiar with the latest applications, technologies, and trends in the IoT industry |
| Comprehension and Application | • Design techniques and processes such as:
| | • Designing for context and implicit interactions
| | • Deciding which UI interaction methods to support and best practice guidelines for each (gestures, tactile buttons, audio, sound, touchscreen, etc.)
| | • Deciding the appropriate device screen size based on privacy and other needs of your target audience (wrist-mounted screen, TV, no screen, etc.)
| | • An understanding of the tools used for physical and digital prototyping synthesis
| | • Sensors > Microprocessors > Actuators
<p>| | • Basic programming for IoT devices |</p>
<table>
<thead>
<tr>
<th>Synthesis and Evaluation</th>
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<tbody>
<tr>
<td>• Research methodologies to drive and validate design concepts</td>
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<td>• Observation, Contextual Inquiry</td>
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<td>• Diary Studies</td>
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<td>• Cultural Probes</td>
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<td>• Paratypes</td>
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<td>• Wizard of Oz</td>
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<td>• Speed Dating and User Enactments</td>
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<td>• Understand how to think critically about and critique design decisions for pervasive applications.</td>
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<td>• Reflect on and discuss pervasive design methods used and solutions.</td>
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<td>• Justify and defend design decisions for pervasive applications grounded in the HCI, CSCW, and UbiComp and Pervasive Computing literature.</td>
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Assignments and Grading

You should do good work in this class because you care about your group project and because you want to learn how to design future pervasive concepts and systems. That said, we must adhere to university policy and use grades, so here is how grades will work in this class:

1. **Group project (80 points)**
   - 10 points: Concept Proposal
   - 20 points: Formative Study Results & Design Proposal
   - 20 points: Experience Prototyping Results & Design Refinement
   - 20 points: Final Demo and Prototype
   - 10 points: Final Proposal & Video

2. **Food for thought questions, sketches, and activities (10 points)**

3. **Participation (10 points)**

You will submit homework to the class forums on Canvas.

Final Grades will be assigned according to the following scale:

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<tr>
<th>Grade</th>
<th>Percentage</th>
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<tr>
<td>A+</td>
<td>98-100%</td>
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<tr>
<td>A</td>
<td>94-97%</td>
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<tr>
<td>A-</td>
<td>90-93%</td>
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<tr>
<td>B+</td>
<td>88-89%</td>
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<tr>
<td>B</td>
<td>84-87%</td>
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<tr>
<td>B-</td>
<td>80-83%</td>
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<td>77-79%</td>
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<tr>
<td>C</td>
<td>73-76%</td>
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<tr>
<td>C-</td>
<td>70-72%</td>
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<tr>
<td>D</td>
<td>60-69%</td>
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<td>F</td>
<td>below 60%</td>
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Assignment and Grading Details

The primary activity in this course will be a design project, which will be carried out in groups of 4 or 5 students. This will be worth 80% of the final grade.

There will be 5 milestones associated with the project, namely:

1. **Concept Proposal** (10%)  
   Based on initial ideation, each group will produce three high level concepts, along with a sketch of a plan describing how each would be researched using formative methods and what the key design questions would be.

2. **Formative Study Results & Design Proposal** (20%)  
   Based on the findings from a formative study to understand users’ needs, and to develop empathy for the context of use, a more detailed design proposal for one of the initial concepts will be presented, along with a justification for the proposed direction and a detailed plan for carrying out the project.

3. **Experience Prototyping Results & Design Refinement** (20%)  
   As an early step in the development of the selected design concept, user feedback will be sought using low-fidelity experience prototyping methods. Based on the findings from these studies, refinements to the initial design proposal will be presented.

4. **Prototype and Final Demo** (20%)  
   The final design will be presented as a live experiential demo, which will seek to document and “sell” the design to an imagined set of stakeholders. Students will demonstrate knowledge of the sensing technologies required for their demo to function correctly and prototype their demo accordingly (e.g., using Arduino, Raspberry Pi, foam core). *For COVID-19 reasons, the final demo will be replaced with a video demonstration as a live demonstration will not be possible*

5. **Final Proposal & Video** (10%)  
   The final milestone will be a proposal for a "real" system based on your prototype and demo. To make your proposal persuasive, you must synthesize the insights obtained from each phase of the project, including ideation, design refinements, needs finding results, evaluations, and final concept. The proposal will be accompanied by a short video showing the imagined interaction with the designed system. *Video from Milestone 4 may be re-used for Milestone 5 during semesters impacted by COVID-19.*
In addition to the project, students will complete the following:

- **Food for thought questions, sketches, and activities (10%)**
  Each week, the instructor will assign questions and/or other lightweight activities related to the week’s readings that students will be required to address/complete. Students are required to post their responses as threaded discussions in Canvas.

- **Participation (10%)**
  You are expected to contribute meaningfully to in-class exercises and discussions. The results of peer feedback will also contribute to this portion of your grade.

**Late assignments**

Many of our classroom activities will involve getting feedback from your peers and the instructor on assignments and on your group project. For this reason, it is important that you finish your homework and group assignments on time and come to class prepared to discuss it.

- Late assignments will be penalized 1 point after the official deadline and additional points per 24-hour period.
- Unexcused reading responses, presentations, or other homework will not be accepted.
- Unexcused late assignments will only exist under very special circumstances and with prior arrangement with the instructor.

**Attendance**

This class does not have a formal attendance policy but your group activities and class participation grade both rely on you being in class. You are responsible for finding out what you missed in class by referring to the syllabus and to your classmates.

**Communication**

All course material (e.g., syllabus, schedule, lecture slides, assignment descriptions) will be made available via Canvas. You are responsible for keeping up-to-date with the materials on Canvas, as dates, assignment details, and lecture topics may change as the semester progresses. The instructors will broadcast announcements via Canvas announcements whenever significant changes are made to the materials.
Classroom Etiquette

To create and preserve a classroom atmosphere that optimizes teaching and learning, we all share a responsibility in creating a civil and non-disruptive forum. Students are expected to conduct themselves at all times in this classroom in a manner that does not disrupt teaching or learning. Classroom participation is a part of your grade in this course. Our in-class discussions should be respectful and courteous to everyone, and relevant to the topic we are discussing. Our discussions are meant to allow us to hear a variety of viewpoints and this will happen if we respect each other and our differences. 

Our time is valuable and behavior which disrupts our learning process may lead to point reductions and/or removal from class.

This course works best when:

- We are all respectful of each other and each other’s time and ideas
- When we are active participants in class discussions and activities
- When we share our past experiences as it relates to the class

Do your best to be on time to class. Please be in your seat and ready to begin class promptly at 6:00 pm.

*The classroom etiquette clause is an updated and modified version of East Carolina University’s Office of Student Affairs’ disruptive behavior clause [https://www.ecu.edu/csstudentaffairs/dos/customcf/classroom_disruption.pdf](https://www.ecu.edu/csstudentaffairs/dos/customcf/classroom_disruption.pdf)
Academic Integrity

Collaboration

UMSI strongly encourages collaboration while working on some assignments, such as homework problems and interpreting reading assignments as a general practice. Active learning is effective. Collaboration with other students in the course will be especially valuable in summarizing the reading materials and picking out the key concepts. You must, however, write your homework submission on your own, in your own words, before turning it in. If you worked with someone on the homework before writing it, you must list any and all collaborators on your written submission. Each course and each instructor may place restrictions on collaboration for any or all assignments. Read the instructions carefully and request clarification about collaboration when in doubt. Collaboration is almost always forbidden for take-home and in-class exams.

Plagiarism

All written submissions must be your own, original work. Original work for narrative questions is not mere paraphrasing of someone else's completed answer: you must not share written answers with each other at all. At most, you should be working from notes you took while participating in a study session. Largely duplicate copies of the same assignment will receive an equal division of the total point score from the one piece of work.

You may incorporate selected excerpts, statements or phrases from publications by other authors, but they must be clearly marked as quotations and must be attributed. If you build on the ideas of prior authors, you must cite their work. You may obtain copy editing assistance, and you may discuss your ideas with others, but all substantive writing and ideas must be your own, or be explicitly attributed to another. See the (Doctoral, MSI, MHI, or BSI) student handbooks available on the UMSI intranet for the definition of plagiarism, resources to help you avoid it, and the consequences for intentional or unintentional plagiarism.
Accommodations for Students with Disabilities

If you think you need an accommodation for a disability, please let me know at your earliest convenience. Some aspects of this course, the assignments, the in-class activities, and the way the course is usually taught may be modified to facilitate your participation and progress. As soon as you make me aware of your needs, we can work with the Services for Students with Disabilities (SSD) office to help us determine appropriate academic accommodations. SSD (734-763-3000; http://ssd.umich.edu) typically recommends accommodations through a Verified Individualized Services and Accommodations (VISA) form. Any information you provide is private and confidential and will be treated as such.

Student Mental Health and Wellbeing

Students may experience stressors that can impact both their academic experience and their personal well-being. These may include academic pressure and challenges associated with relationships, mental health, alcohol or other drugs, identities, finances, etc.

If you are experiencing concerns, seeking help is a courageous thing to do for yourself and those who care about you. If the source of your stressors is academic, please contact me so that we can find solutions together. For personal concerns, U-M offers the following resources:

- Counseling and Psychological Services (CAPS) - confidential; For mental health support, you can access CAPS by calling the central office at (734) 764-8312 or by emailing the School of Information Embedded Psychologist, Ashley Evearitt, Psy.D., at evearitt@umich.edu. If you’re experiencing a mental health crisis or emergency, you can call CAPS 24/7, the UM Psychiatric Emergency Services (PES) at (734) 936-5900, or 911.
- Dean of Students Office - 734-764-7420; provides support services to students and manages critical incidents impacting students and the campus community
- Ginsberg Center for Community Service Learning - 734-763-3548; opportunities to engage as learners and leaders to create a better community and world
- Multi-ethnic Student Affairs (MESA) - 734-763-9044; diversity and social justice through the lens of race and ethnicity
- Office of Student Conflict Resolution - 734-936-6308; offers multiple pathways for resolving conflict
- Office of the Ombuds - 734-763-3545; students can raise questions and concerns about the functioning of the university.
Services for Students with Disabilities (SSD) - 734-763-3000; accommodations and access to students with disabilities

Sexual Assault Prevention and Awareness Center (SAPAC) - confidential; 734-764-7771 or 24-hour crisis line 734-936-3333; addresses sexual assault, intimate partner violence, sexual harassment, and stalking

Spectrum Center - 734-763-4186; support services for LGBTQ+ students

Trotter Multicultural Center - 734-763-3670; intercultural engagement and inclusive leadership education initiatives

University Health Service (UHS) - 734-764-8320; clinical services include nurse advice by phone, day or night

Well-being for U-M Students website - searchable list of many more campus resources

Wolverine Wellness - confidential; 734-763-1320; provides Wellness Coaching and much more

COVID Statement

For the safety of all students, faculty, and staff on campus, it is important for each of us to be mindful of safety measures that have been put in place for our protection. By returning to campus, you have acknowledged your responsibility for protecting the collective health of our community. Your participation in this course on an in-person basis is conditional upon your adherence to all safety measures mandated by the State of Michigan and the University, including maintaining physical distancing of six feet from others, and properly wearing a face covering in class. Other applicable safety measures may be described in the Wolverine Culture of Care and the University’s Face Covering Policy for COVID-19. Your ability to participate in this course in-person as well as your grade may be impacted by failure to comply with campus safety measures. Individuals seeking to request an accommodation related to the face covering requirement under the Americans with Disabilities Act should contact the Office for Institutional Equity. If you are unable or unwilling to adhere to these safety measures while in a face-to-face class setting, you will be required to participate on a remote basis (if available) or to disenroll from the class. I also encourage you to review the Statement of Students Rights and Responsibilities, which includes a COVID-related Statement Addendum.
Note on SI612 Location for Winter 2021

This class is typically taught in-person but had been modified to accommodate the ever-changing COVID-19 situation. We will make sure that any student that needs or wants to complete this class remotely is able to do so and is set up for success. As of now, we do not have a classroom assigned and we plan to teach 100% remotely.

That said, instructors may meet some students in-person for office hours (upon request), may make trips to campus a few times throughout the semester to distribute materials students may want to borrow, and there are a couple of class exercises later in the semester that some of us could choose to complete in-person, depending on the current COVID-19 status. We are willing to be flexible to help our students ... as long as it is safe to do so. Please see the COVID Statement above for additional details.