Inst 775 HCI Capstone Preparation

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February 1, 2019

Mondays 1:00-4:45 pm and Thursdays 6:00-8:45 pm
Location: HBK 2119
Course site (Google Team Drive): https://drive.google.com/drive/u/0/folders/0AEmWBDuUGU_Nu9PVA
Communications (Slack): https://hcimcapstone2018-19.slack.com
Grading (ELMS) site: https://myelms.umd.edu/courses/1249182

Instructor

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Course description

Students pursuing the University of Maryland’s Master of Science in Human-Computer Interaction (HCIM) program with a professional focus complete a two-semester Capstone project as to finish their Master's degree. The Capstone runs the academic year, from late August through early May. Students work in teams to complete a real project for an industry or non-profit partner. HCIM faculty serve as overall project managers and coaches to the team. The students execute on the project, managing day-to-day activities and applying their training in user-centered design techniques. Deliverables meet defined expectations comparable to those produced by industry product teams or consultancies. The Capstone is meant to deepen the students' learning of user-centered design, helping them hone their skills to a professional level.

The project focus typically is an area that the sponsor is interested in exploring for potential: a new market, technology, mobile app, etc. Projects produce insight from user research, validated design concepts and strategic guidance that sponsors can then take forward. Projects are structured to have a challenging problem or opportunity that requires user research and iterative design explorations to produce product designs and interactive prototypes. Recent projects with community and industry partners include:
Student learning outcomes

By the end of the fall semester (INST 775), students will be able to:

1. Work as a collaborating team to execute on the plan to ensure on-time delivery to the client;
2. Gather field data and third-party knowledge, integrate the findings in a way that communicates and drives ideation;
3. Vision solutions for the client, and represent them in sharable form;
4. Participate on time, responsibly, and with quality fulfilling the roles that they are playing on the team;
5. Present to the client in a professional, articulate manner.

By the end of the spring semester (INST 776), students additionally will be able to:

1. Execute the steps of detailed design in a user-centered design process as a team;
2. Storyboard and define the concept defined above and selected by the client for detailed design;
3. Create an appropriate system structure, interaction design and visual design all iterated with customers;
4. Create an interactive mockup representing the product or application concept
5. Produce the expected deliverables for the client;
6. Use good team techniques for critique and review of their design artifacts.

Methodology

The Capstone applies an industry standard design practice, adapted as appropriate to specific project needs. We use contextual design (see Holtzblatt, K. & Beyer, H., 2016, *Contextual Design: Design for Life, 2nd Ed.*, Morgan Kauffman; see also [https://en.wikipedia.org/wiki/Contextual_design](https://en.wikipedia.org/wiki/Contextual_design)). Contextual design defines a process and set of assessment, analysis, design, and evaluation activities that are widely used for
technology product and service design. A project will typically involve multiple steps, performed iteratively:

- Background research using academic and industry literature
- Market research of similar or competing products
- Understanding user needs through contextual (field) interviews and observation
- Data interpretation, analysis, and modeling
- Product concept visioning
- Storyboarding
- Interaction design
- Visual design
- Prototyping
- Evaluation of system improvements

The process reflects common industry practice and is focused on delivering a tested product concept that meets the sponsor's needs and is reasonable to implement for the target population and available technology. UCD is inherently iterative, and you will be continually revising and improving your work based on feedback from the instructor, your peers, and industry experts. You will often have multiple tasks underway at once, so you will also gain project management experience.

**Project structure**

The capstone project runs the academic year, from September through early May. Students are assigned to teams (typically 4 people) based on their skills, interest, and fit with each project. During the summer before the capstone, the Capstone Coordinator plans the project with the partner, outlining the scope of the investigation and ideation.

During the Fall semester, students conduct research, gather data and synthesize it into potential product concepts. First, they conduct secondary research as appropriate to understand the types of users and typical needs, drawing on selected academic and industry literature, as well as any information available from the sponsor. They then conduct market research to identify and analyze similar products. Depending on the project, they may meet with technical or other staff from the sponsor, e.g. to capture current technical capabilities and constraints.

They then gather primary data through Contextual Interviews with 15-20 (total) participants who are representative of the sponsor’s target audience. A contextual interview is a form of qualitative, formative user research where users are interviewed and observed as they conduct their work activities. A typical interview takes two hours and is conducted at the interviewee's place of work. The interviewer walks through the interviewee's use of the system as well as the broader context of use. This provides deep insight into motivations, goals, particular pain points, etc.

The collected data is analyzed and consolidated into an affinity diagram and other visual models of users, their context of use, specific tasks, pain points, etc. Students use these to generate product concepts to better support users. These deliverables will be presented to the sponsor at the Phase 1 Deliverables meeting in December. At that meeting, we facilitate a discussion of the product concepts to identify the elements that are most valuable for the
sponsor. Concepts are reviewed with respect to technical feasibility, financial issues, and the business operations model to assess constraints and opportunities. At the end of the meeting we will mutually agree upon a product concept (or elements from several concepts) that will be prototyped and validated.

During the Spring semester, we conduct three rounds of prototyping and evaluation. We evaluate the prototype at each round with 5-6 participants and share the findings and ongoing design revisions with the sponsor. Typically, the first prototype is sketch-based, the second is a paper-based mockup, and the third is an interactive mockup that includes the visual (graphical) design. At the end of the Spring semester, the validated design is presented to the sponsor as an interactive mockup at the Phase 2 Deliverables meeting. We then facilitate a discussion with sponsor. The objective is to provide a long-term vision and guidance for ongoing development, along with suggestions for incremental changes to the current system.

There are three major project meetings, typically held at sponsor’s office:
- Project Kickoff meeting - 4 hours, late September/early October
- Phase 1 Deliverables - 4 hours, early December
- Phase 2 Deliverables - 4 hours, late April/early May

Intermediary project update meetings are scheduled approximately monthly, held at UMD or online.

**Project deliverables**

Each week students produce work products that are critiqued. They then revise as needed to reach a level of professional quality. The specific project deliverables vary by project, and include:

For the fall:
- Oral presentation, with slides, of key research findings and 2-3 product concepts
- Affinity diagram and experience models

For the spring:
- Oral presentation, with slides, of findings and final recommendations
- Interactive mockup
- Written report - findings and design recommendations for one concept
- Project web site

**Intellectual property and confidentiality**

Capstone projects are good experiences for you because you gain direct experience producing work that is valuable to your client. Some projects may require that you sign an agreement (see the provided sample agreement) that grants the client a non-exclusive, permanent license to use your work. This is to ensure that the client can then use the work as needed for their business, while ensuring your ability to use it in your portfolio, discuss it with potential employers, etc. If you have concerns about intellectual property, please
contact the instructor. We will not force anyone to work on project for which they don’t want to sign an agreement – we will have alternative project options.

As part of your project, you may have access to confidential or proprietary company information. You have a professional obligation to maintain and protect the confidential status of confidential and proprietary information. This includes following appropriate data security practices. We do not want to jeopardize their business or our relationship with them, and you do not want to jeopardize the potential for a good reference.

**Ethical considerations**

Because the Contextual Design process involves working with users, students are trained in ethical professional conduct. This including completion of the CITI Social & Behavioral Research course. They apply these practices in their capstone projects as appropriate. We are committed to respecting the confidentiality of any participant involved in the project. Aggregate (non-identifiable) user data and artifacts created during the project will be shared with the partner. Data when represented in any form is disassociated from the individual.

The University of Maryland College Park (UMCP) IRB has determined this project does not meet the definition of human subject research under the purview of the IRB and thus does not require review by the university IRB. The iSchool does not expect Capstone projects to produce generalizable knowledge, such as new UX principles or theories. Project outcomes are focused on the specific circumstances and needs of the partner organization. Any new knowledge generated is thus specific to the circumstances of the project and the partner.

**Typical Timeline**

*Activities and timeline are tailored to each project and subject to change.*

<table>
<thead>
<tr>
<th>Date</th>
<th>Activities</th>
<th>Work products</th>
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<tbody>
<tr>
<td>Sept</td>
<td><strong>Preparation.</strong> UMD staff prepares students. Partner arranges for field interviews.  <strong>Mini-project</strong> – to refresh student knowledge of UCD methods and fill in any gaps  <strong>Project Kick-off Meeting - with partner</strong></td>
<td>Mini-project user research presentation</td>
</tr>
<tr>
<td>Oct</td>
<td><strong>Secondary and market research</strong>  <strong>Field interviews, interpretation</strong></td>
<td>Affinity notes  Experience models</td>
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<tr>
<td>Nov</td>
<td><strong>Consolidate affinity and experience models</strong>  <strong>Prepare consolidation and communication design - Team presents the completed affinity and consolidated models to partner.</strong>  <strong>Visioning product concepts.</strong> Walk the affinity diagram and models, putting design ideas on to the data. Visioning session to identify new product concepts.  <strong>Product concept elaboration and optimization.</strong> Elaborate and optimize selected product concepts. We end by</td>
<td>Affinity diagram  Consolidated models  Consolidated product concepts</td>
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consolidating the ideas into a set of product concepts – candidates for detailed design and validation.

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<tr>
<th>Dec</th>
<th>Present user research findings and consolidated product concepts to client. Select concept(s) for detailed design and validation during spring.</th>
<th>Product concepts, for detailed design and validation.</th>
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<tbody>
<tr>
<td>Jan &amp; Feb</td>
<td>Storyboarding and user environment design (UED). Review and tune the list of scenarios and design patterns. Storyboard key scenarios. Describe UI structure with the UED.</td>
<td>Scenarios, key storyboards, UED.</td>
</tr>
<tr>
<td>Feb</td>
<td><strong>Paper prototype creation.</strong> Finalize UED to validate and create mockups.</td>
<td>Paper prototype</td>
</tr>
<tr>
<td>Mar</td>
<td><strong>Mock-up review and testing.</strong> Review and normalize designs as necessary. Iteratively conduct mock-up interviews, review issues and refine designs and prototype. Typically 3 rounds with 4-5 people each round.</td>
<td>Revised designs and prototypes.</td>
</tr>
<tr>
<td>Apr</td>
<td><strong>Visual design and testing.</strong> Iteratively create visual design, moving from static mock-ups to interactive prototypes using tools like Envision, XD. Review and refine. Typically 3 rounds with 5-6 people each round.</td>
<td>Visual design</td>
</tr>
<tr>
<td>May</td>
<td><strong>Present final recommendations &amp; validated design to client</strong></td>
<td>Interactive mockup</td>
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**Grading**

Two types of marks are used in this course: Letter grades and check marks, both with plus (+) and minus (-) modifiers. These have equivalent numeric values, similar to GPAs. Your final grade for the course is computed as the weighted average of all your assessment grades.

Team-based assessments will include a peer evaluation element and may be adjusted to reflect individual contributions.

I am happy to discuss any of your grades with you, and if I have made a mistake I will correct it. Any formal grade disputes must be submitted in writing within one week of receiving the grade.

The marks and equivalent values are:

<table>
<thead>
<tr>
<th>Letter mark</th>
<th>Check mark</th>
<th>Numeric value</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>A+</td>
<td></td>
<td>4.3</td>
<td></td>
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</table>
A ☑+ 4.0  Reflects work, knowledge or skill that is equivalent to that which an entry-level professional or doctoral student would produce.

A- 3.7

B+ 3.3

B ☑ 3.0  Reflects work, knowledge or skill that is competent graduate work but is not yet equivalent to that which an entry-level professional or doctoral student would produce.

B- 2.7

C ☑- 2.0  Reflects substandard graduate work

D 1.0

F 0  E.g., missing assignment

Assessment and feedback

In the spirit of professional practices, I provide assessment and feedback in the manner that I would as a manager or team lead, that is, continuously, using many of the same methods that we teach for critique. Feedback is primarily oral, conducted during class meetings, using criteria that we discuss and elaborate during class. You are expected to listen to everyone’s feedback, not just your own, and apply it to your learning and your work. My experience is that most feedback is relevant to most students, so please take advantage of this. Always take written notes on any feedback received by you or your peers. Overall assessment is based on the following elements.

<table>
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<tr>
<th>Activity/assignment</th>
<th>Percent of grade (approximate)</th>
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<tbody>
<tr>
<td>Quality of weekly work products and preparation</td>
<td>40</td>
</tr>
<tr>
<td>Participation, including quality of professional interactions, participation in critique and peer assessment activities</td>
<td>30</td>
</tr>
<tr>
<td>Client Presentation and final semester deliverables</td>
<td>30</td>
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Textbooks and readings


Required Technology

The technology will vary depending on your project. You are responsible for ensuring that you have the right hardware, software and infrastructure for your project.
A Note on Policies

The essential purpose of the university's policies (www.president.umd.edu/policies/) is to enable all of us to fully participate in an equitable, accessible and safe academic environment so that we each can be challenged to learn and contribute most effectively. Policies are, by necessity, often written in impersonal, legalistic language. Nevertheless, we are all responsible for following them. The following sections summarize selected policies as implemented for this course, and provide links to additional information. We are all responsible for knowing and following all university policies.

Attendance Policy

Attendance at all meetings (Mondays and Thursdays) is required, as well as at scheduled client meetings. Travel and other commitments must not interfere with client or class meetings. Throughout the year, we will meet with clients and other professionals to provide updates, get critiques, etc. These meetings are essential, and you must attend them. Note in particular that we will schedule client meetings through Tuesday, December 18. and our first spring class meets Monday, January 28. Failure to attend any class or external meeting, except as excused by university policy (https://president.umd.edu/sites/president.umd.edu/files/files/documents/policies/V-100G.pdf) or as noted below, will result in a 1/3 point reduction in your final grade for each missed meeting.

You are permitted one missed class meeting per semester under the following conditions: a) you consult with me at least 3 weeks in advance (preferably at the beginning of the semester), b) it is not an external meeting, and c) you make appropriate arrangements with your team.

I have established this policy both to ensure that all groups meet their client deliverables in a professional way and to support your development of essential "soft skills" for the workplace, including prioritizing work deadlines, being accountable to supervisors and teammates, and being a consistent, reliable performer.

Academic Integrity

Academic dishonesty is a corrosive force in the academic life of a university. It jeopardizes the quality of education and depreciates the genuine achievements of others. Apathy or acquiescence in the presence of academic dishonesty is not a neutral act. All members of the University Community - students, faculty, and staff - share the responsibility to challenge and make known acts of apparent academic dishonesty. As a student, you have a responsibility to avoid violations of the Code of Academic Integrity. This includes:

- Cheating: "Intentionally using or attempting to use unauthorized materials, information, or study aids in any academic exercise."
- Fabrication: "Intentional and unauthorized falsification or invention of any information or citation in an academic exercise."
- Facilitating Academic Dishonesty: "Intentionally or knowingly helping or attempting to help another to commit an act of academic dishonesty."
- Plagiarism: "Intentionally or knowingly representing the words or ideas of another as one's own in an academic exercise."
Students with Disabilities

The University is legally obligated to provide appropriate accommodations for students with disabilities. The campus’ Disability Support Services Office (DSS) works with students and faculty to address a variety of issues ranging from test anxiety to physical and psychological disabilities. If a student or instructor believes that the student may have a disability, they should consult with DSS (301-314-7682, dissup@umd.edu, www.counseling.umd.edu/DSS/). To receive accommodations, students must first have their disabilities documented by DSS. The office then prepares an Accommodation Letter for course instructors regarding needed accommodations. Students are responsible for presenting this letter to their instructors.

Late Work

I do not accept late work unless I have approved it by prior arrangement. If you have to miss a deadline, you should inform me as soon as possible, indicating the reason and when you propose to submit your work. The general policy is that late work will be deducted 20% of its total grade per calendar day, starting on the same day it is due. If you have a legitimate reason, such as a major medical or family emergency, I may agree to an extension or makeup work, which I will grade at the end of the semester. Documentation of the emergency (e.g. a doctor’s letter) may be required.

Course Evaluation

Course evaluations are a part of the process by which the University of Maryland seeks to improve teaching and learning. The University Senate approved the implementation of a standard, online, University-wide course evaluation instrument. Each course evaluation contains a set of universal questions, and some are supplemented by questions from specific colleges. Students who leave no "Pending" evaluations in their Evaluation Dashboard each semester can view the aggregate results of a sub-set of universal items online. Across the University, course evaluations are being administered through a web-based system dubbed CourseEvalUM. All information submitted to the Evaluation System is confidential. Instructors and academic administrators can only view summarized evaluation results after final grades have been submitted. Instructors and academic administrators cannot identify which submissions belong to which students. This standardized set of evaluation results provides the University with useful information on teaching and student learning across the campus. For additional info see Student Fast Facts at www.irpa.umd.edu/Assessment/CourseEval/stdt_faq.shtml

Emergency Preparedness

See: www.umd.edu/emergencypreparedness/

Syllabus Change Policy

This syllabus is a guide for the course and is subject to change with advance notice. Changes will be announced in Slack.