CS590C – Human-Computer Interaction
(3 credits)

University of Massachusetts-Amherst
Course Information & Syllabus

Course Dates: Spring 2018   January 22 – May 10

Course Meetings: Mon & Wed: 4-5:15pm; Engineering Lab. 323

Monday
SPIRE # 60945 - Section 01AA (61963)

Wednesday
SPIRE # 60946 - Section 02AA (61964)

Instructor Info: Eva Hudlicka   hudlicka@cs.umass.edu

Teaching assistants: TBA

Office Hours: By appointment

I.   Course Description

This course will provide an in-depth introduction to Human Computer Interaction (HCI). The topics will include: HCI history; discussion of human capabilities and limitations (perceptual, cognitive, physical), human error, and human emotions, and their relevance for HCI; generic principles of design and the principles guiding user interface and interaction design; design of WIMP (windows, icons, menus, pointing) and direct-manipulation user interfaces; virtual and augmented reality and novel modes of interaction; approaches to prototyping (storyboarding, paper prototyping, and low- and high-fidelity user interface prototyping); cognitive modeling; usability evaluation; affective HCI and current trends in HCI; as well as ethical considerations.   There is one short project and a major semester-long project that involves design, prototyping and development of an app or a web-base system. Please note that software development will be required for the app / web site. Students may use a development environment / language of their choice, however, XCode / Swift are recommended and some instruction will be provided regarding Swift and the XCode environment.

On-line format

This class is being taught in a format that includes both an on-line and a face-to-face component. There will be one weekly meeting, which will include class discussion, in-class lab work, studio presentations of on-going project work, quizzes and "HCI News" presentations. Weekly attendance is required. The on-line component includes lecture slides, readings and audio recordings of lectures, as well as links to other relevant materials (e.g., videos). On-line material will be available on Moodle.

It is expected that students will read the material posted on Moodle, and come to class prepared to discuss the lectures and readings.

II.   Textbooks

• "The Design of Everyday Things" (ISBN-10: 0465067107)
        by Donald Norman, Basic Books, 2002   (available on Moodle)

• "Designing with the Mind in Mind" (2nd Ed.) (ISBN: 978-0-12-407914-4)
        by Jeff Johnson, Elsevier, 2014 (most chapters available on Moodle)

• "Don't Make Me Think!: A Common Sense Approach to Web Usability - Revisited" (3rd Ed.)
 (ISBN-10: 0-321-96551-5) (earlier edition is OK) by Steve Krug, New Riders, 2014 (most chapters available on Moodle)

• "Human-Computer Interaction" (3rd Edition) (0130461091)
   by Alan Dix, Janet Finlay, Gregory Abowd, Russell Beale, Prentice Hall, 2003 (available on Moodle)

• Selected recent journal articles and conference papers from CHI, UMUAI, HCI, ACII, ICMI

 (OPTIONAL)

• "Human–Computer Interaction: Fundamentals and Practice" (ISBN: 978-1-4822-3389-6)
by Gerard Jounghyun Kim, Taylor & Francis, 2014

• "Designing the User Interface: Strategies for Effective Human-Computer Interaction" (5th Ed.)
(ISBN-10: 0321537351) (earlier edition is OK)
        by Ben Shneiderman & Catherine Plaisant, Prentice Hall, 2009

• Visual Display of Quantitative Information
   by Edward Tufte

• "Emotional Design: Why We Love (or Hate) Everyday Things" (1st Ed.)
   (ISBN-10: 0465051367) by Donald Norman, Basic Books, 2005

   One of the following two books on HTML/CSS:

• "HTML & CSS Design and Build Websites" (ISBN: 978-1-118-00818-8)
        by Jon Duckett, John Wiley & Sons, 2011

• "HTML & CSS" (8th Ed) (ISBN-10: 0-321-92883-0)
        by Elizabeth Castro & Bruce Hyslop, Peachpit Press, 2014

III.   Evaluation Criteria

Students are expected to complete the reading assignments, attend classes consistently, participate in class discussion and other class activities, complete all stages of the class projects (as outlined in this syllabus and discussed in class), present "HCI News", and present final project summaries and demos during the last class. There will be weekly short quizzes.

"HCI News": Each class will include a brief presentation (5-10 minutes) by students on a selected topic of interest in HCI.

Projects: All projects are group projects (4 students/group). Each project must include a breakdown of the work; that is, who did what and how each group member contributed.

Submission Policy: All assignments are to be submitted via Moodle, unless otherwise specified.

Assessment:

Project 1	Application of Norman's principles of design	10%
Project 2	Term project: develop a web-based system or mobile app	35%
Quizzes	Weekly quizzes	15%
Exam	In-class – closed book / closed notes	20%
"HCI News"	Presentations of student-selected topics in HCI	10%
In-class work	Class discussion & participation in in-class assignments & studios	10%

Late policy:

Please note that midnight is in fact midnight. Work submitted after midnight is considered late.
Late work without a valid prior reason will automatically lose 10% of the possible points.
Work that is turned in up to a week late will be penalized 10%.
Work that is turned in more than one week late will be penalized 25%.
Work that is turned in more than two weeks late will be penalized 50%.
Work that is turned in more than three weeks after due date will not be graded.

Additional information

Teamwork
• All projects are done in teams
• You may switch teams / form new teams up until Project 4. Project 4 must be done with the same team throughout the project
• Team issues do arise – this is to be expected. You should first attempt to resolve them within the team and if this doesn't work, come see the instructor or the TA.
• Do not wait to address team issues because they can severely impact your project and your overall "experience" and, ultimately, the project grade

Letters of recommendation
Please note that am not able to provide letters of recommendation for graduate schools

IV. SCHEDULE (Subject to minor changes in topics and project due dates)

Date	Topics / Readings	Assignment
Wk. 1 Jan 22	Course overview / History of Human Computer Interaction / Future Trends Generic design principles	Project 1 Assigned Project 2 Assigned
Wk. 2 Jan 29	Human capabilities – attention, perception (visual, auditory), cognition & situation awareness; physical capabilities & limitations)	
	Human emotion & importance of emotion in HCI & design	
Wk. 3 Feb 5	Requirements analysis & knowledge elicitation (direct & indirect KE methods)	Project 1 Due
	Task analysis and task models; Mental models & Situation awareness	
Wk. 4 Feb 12	UI design process & principles; Scenario based design Interaction metaphors & Interaction styles; Input & Output devices	Project 2.1 Due (Initial ideas)
	Visual Design & Gestalt laws of perception; Elements of graphic design; Use of color; Studio	

Wk. 5 Feb 19	No class on Monday – Holiday	Project 2.2 Due (RA/KE)
	Designing elements of UI (command languages, screens, forms, WIMP elements)	
	Direct manipulation interfaces; Virtual reality and augmented reality interaction	
Wk. 6 Feb 26	Storyboarding & paper prototyping	Project 2.3 Due (3 tasks)
	Overview of the XCode environment; Intro to Swift language (Apple / iOS devices)	
Wk. 7 Mar 5	Exam I (in class; closed book – closed notes) (XCode / Swift will NOT be on the exam)	
	Web design principles; Information architectures	
March 11 – 19 - Spring break		
Wk. 8 Mar 19	Human error & error types & error taxonomies	Project 2.4 Due (Storyboards)
	Designing to avoid error	
Wk. 10 Mar 26	Rapid prototyping	
	Usability evaluation; Usability in broader context: socio-technical systems	
Wk. 11 Apr 2	Cognitive & affective modeling	Project 2.5 Due (Paper prototype)
	Multi-modal interaction	
Wk. 12 Apr 9	Visualization (Tufte); Studio	
	User interface management systems	
	Additional XCode / Swift topics	
Wk. 13 Apr 16	Holiday (Monday session meets on Tuesday, April 17)	
	Affective computing Virtual intelligent agents & social robots	
Wk. 14 Apr 23	User modeling & affective user modeling; user-adapted interaction	Project 2.6 Due (User testing)
	Ethical issues in HCI; Future trends & challenges	
Apr 25	Wednesday Section – Project 2 presentations (2.7)	Project 2.7 Due (Presentation rehearsal)
Wk. 15 Apr 30	Monday Section – Project 2 presentations (2.7)	Project 2.7 Due (Presentation rehearsal)
	Last day of classes Tuesday May 1	Project 2.8 Due (Prototype + demo)
Finals week May 3	Student project presentations and demos (during the scheduled final period)	Project 2.9 Due (Final presentation)
May 9		Project 2.10 Due (Final report + code / demo)