**CS/PSYC 6755 | Human-Computer Interaction (HCI)**

**Syllabus (from 8803-HCI Fall 2015)**

This course will teach you about the importance of the human-computer interface in the design and development of things people use. We will touch on many of the perceptual, cognitive, and social characteristics of people, as well as methods for learning more about the people you wish to use your systems (analyzing the tasks they perform, the way they perform them, the way they think and feel about what they do, etc.). We will discuss the capabilities and limits of computers and other related systems, and discuss how that affects design and implementation decisions.

We will also cover methods of **evidence-based design**, and ways to implement, evaluate, and improve a design. This includes discussion of User Centered Design and Universal Design philosophies. The course will be a blend of perceptual/psychological, social, design, and computer science elements. You will work on individual and group projects to learn in a hands-on way about the various stages of an effective design process. This course is a complement to the two other core courses in the **MS-HCI Program** at Georgia Tech; specifically PSYC 6023 Research Methods for HCI, and CS/PSYC/ID/LMC 6753 Professional Preparation.

**Semester Theme: HCI On the Go.** We are going to adopt the theme of "Human-Computer Interaction On the Go" for the semester. The group projects will have something to do with humans and computers/information technology interacting in a moving or mobile or off-the-desktop context. This may mean something related to mobile computing, jogging, driving, rolling in an wheelchair, skiing, flying, rowing, shopping, sight-seeing, cycling, etc....Pretty much any situation where humans interact with technology (or could do so) when they are out and about. So think outside the box!

You can think of systems that help a person, a group, an agency, or society. Assistive technology devices, public access stations/kiosks, training, services...Solutions can be formal, informal; large, small; physical or virtual; permanent or ad hoc; wearable, hearable, tablet, mobile, or augmented reality... You can also work on a system that helps people on the go, even if they are not specifically moving (e.g., a bus route planning website or application). Or, for example, you could develop a system to help kids get on the right school bus....Did I mention that you should think outside the box?

Note that not *everything* in the class will be centered on the theme. We are just trying for a bit of common ground across the projects. Further, the HCI aspects in this area are common to many other important areas. For example, developing a training system relates to creating kiosks, and web services, and mobile devices, and all of these can be thought of as research tools... You get the idea.

**Learning Objectives**

* To facilitate communication between students of psychology, design, and computer science on user interface development projects.
* To provide the future user interface designer with concepts and strategies for making design decisions.
* To expose the future user interface designer to tools, techniques, and ideas for interface design.
* To introduce the student to the literature of human-computer interaction.
* To stress the importance of good user interface design.

**Meeting Time:** Mon/Wed/Fri - 1:00-2:00pm

**Meeting Place:** Klaus 1447

**Instructor**

**Dr. Bruce N. Walker**

* Office: J.S. Coon Psychology Building, Room 230
* Phone: 404-894-8265
* Email: bruce.walker@psych.gatech.edu
* Office Hours: please email to make an appointment

**Other Section/Instructor**

No other sections are offered in the Fall semester.

**Teaching Assistants**

**Brianna Tomlinson (btomlin AT gatech.edu)**

**Stanley Cantrell (stanleyjcantrell AT gmail.com)**

**Text books**

There is one **required** text book, and two recommended text books for the class. In addition there will be additional reading assigned during the semester. Note that the recommended text books are the required text books for PSYC 6023 Research Methods for HCI.

**Required text book:**

***Interaction Design: Beyond Human - Computer Interaction* (4th ed.), by Jenny Preece, Yvonne Rogers, Helen Sharp**. Wiley, 2015.

Book web site: **http://www.id-book.com/**

Available at the GT Book Store.

Amazon: **amazon.com** and other places for both new and used editions. It is also available in electronic format, and for rent.

**Recommended additional text books:**

***Understanding Your Users: A Practical Guide to User Requirements Methods, Tools, and Techniques* (2nd ed.), by Kathy Baxter, Catherine Courage, and Kelly Caine**. Elsevier, 2015.

Available at the GT Book Store.

Amazon: **amazon.com** and other places for both new and used editions. It is also available in electronic format, and for rent.

***Measuring the User Experience: Collecting, Analyzing, and Presenting Usability Metrics (Second Edition)* (2nd ed.), by Thomas Tullis & William (Bill) Albert**. Waltham, MA: Morgan Kaufmann/Elsevier. 2013.

Available at the GT Book Store.

Amazon: **amazon.com** and other places for both new and used editions. It is also available in electronic format, and for rent.

Optional: ***The Design of Everyday Things*, by Donald Norman**. Currency/Doubleday, 1990.

Available at the GT Book Store. See also: **amazon.com** and other places for both new and used editions.

**Additional Reading**

Additional reading will be required. Typically they will be posted as PDFs on the class web site (see **schedule page**). It is the responsibility of the students to obtain and read the extra material. The material in those extra readings may be included on tests and other evaluations in the class.

One book that will be referred to a lot is:

*Universal Usability*, edited by Jonathan Lazar. Wiley, 2007. (See the [**schedule page**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/schedule.html) for details on readings.)

**Grading**

*Assessment Philosophy:* HCI is a very broad, interdisciplinary domain. There is simply a lot of information that an HCI professional needs to know and understand in order to be effective. It takes a number of different sources, a number of different types of learning to gather this breadth of material. Not everything can be covered in the lectures or discussed in class--reading journals and books is neccesary. Not everything can be learned in books either--practice, field work, and team projects are called for. In order to assess your learning of this range of material, it is necessary to have a multitude of assessment techniques. This includes individual and team work; conceptual knowledge and rote memorization; calculations and aesthetic judgments; written assignments and inclass exams. It is all important.

Your final grade is made up of four major components, homework assignments, projects, exams, and class participation. The weighting of these components is described below.

Students are expected to do their own work at all times and to follow the university's codes of academic conduct and honor code. Cases of suspected inappropriate collaboration or cheating will be immediately forwarded to the Dean of Student Affairs, and will be pursued to resolution. This is an unpleasant process for all involved, so please do not put yourself in this situation.

Students are expected to conduct themselves in a professional manner--this entails showing up for classes and exams at the appointed time. Late make-up exams will not be given. If some form of prior committment prevents a student from taking an exam at the given time, PRIOR arrangements (including documentation where appropriate) should be made with the instructor.

Extra work, after the semester, is not allowed to "bring up" a grade. A student's grade shall be earned from their performance solely on the semester's assignments.

Grading is determined by a semester-long accumulation of points, weighed in percentage as stated for each component as summarized below. Determinations of the individual category breakdowns will be determined by looking for gaps or clumps in the final averages.

**Examinations**

A mid-term and a final examination are planned for the course. Most exam questions will reflect the material covered in lecture and assigned reading. The exams will consist mostly of short answer questions, with a few multiple-choice, T-F, and longer essay questions thrown in as well. Each exam will determine 15% of your grade (30% total for the exams).

**Homework Assignments**

There will be three or four homeworks assigned for individual completion (not a group effort). You will have about a week to complete each one. The goal of the homeworks is to give you practical experience in the processes and methods used in this field. They might range from observing people in a mini field study, to sketching a prototype, to mocking up an interface in Photoshop or VisualBasic, to designing a research study. The homeworks will be worth a total of 15% of your final grade.

**Project**

A semester-long, team-based interface design project will be given in this course. The project will be broken down into four parts, each around three weeks in duration. The overall grade for the project will be 45% of your grade, with the individual parts of the project worth approximately 10% of your grade, each. The project will have your team develop an alternative interface for some computer-based application. The assignments will have you evaluate users, needs, and tasks in the domain, design a mock-up for a new interface, develop a prototype of that interface, and evaluate your design. The material which you turn in should be presented professionally, and should stress grammatical correctness and clarity. An electronic version of the project will be posted to the Web; a paper version will also be handed in. There will be templates available to let you know more about the format for submitting your work, and to provide some idea of what is expected. You will be judged on your originality, innovativeness, quality of writing, and correctness. Further details will accompany each assignment.

**Class Participation**

Reading assignments will be specified for each week. You are expected to come to class, and be prepared -- that is, having read and having made an attempt to understand the material. You should be ready to discuss the material covered in the lectures and reading. Much of the material in this course is subjective. Feel free to describe your views. A total of 10% of your grade will be determined by a subjective participation rating. If you come to class prepared and participate in discussions, you can anticipate receiving all of this credit.

**NOTE:** A portion of your class participation grade will be determined by the other members of your project team, via an anonymous process. If you participate and "pull your weight" in the project, you will receive full points for that; you may also receive fewer points, or even bonus points, as deserved.

**Summary**

Below is presented the weight of the different course components toward your final grade.

|  |  |  |
| --- | --- | --- |
| **Component** |  | **Weight** |
| HWs |  | 15% |
| Participation |  | 10% |
| Project |  | 45% |
| Midterm exam |  | 15% |
| Final exam |  | 15% |

**Accommodations Policy**

If you are a student with a disability and you need academic accommodations, please see me and contact the Disability Services (404-894-2563), http://www.ohr.gatech.edu/ers/disability. All academic accommodations must be arranged through that office. They will then contact me with instructions.

**Academic Integrity**

Academic dishonesty will not be tolerated. This includes cheating, lying about course matters, plagiarism, or helping others commit a violation of the Honor Code. Plagiarism includes reproducing the words of others without both the use of quotation marks and citation.  Students are reminded of the obligations and expectations associated with the Georgia Tech Academic Honor Code and Student Code of Conduct, available online at www.honor.gatech.edu**.**

**Excused Absence Policy**

http://www.catalog.gatech.edu/rules/4/

**Some Other Comments...**

*Respect and Consideration*: Please, above all, be respectful and considerate of others in the class. It should go without saying, but this includes showing up on time for classes, team meetings, exams, etc. Please turn your cell phone, pager, PDA, or any other alarms and ringers **off** while you are in class. If you disturb the class (including incoming phone calls), you may be asked to leave.

**Schedule**

Information in this schedule will change as the term progresses. This version of the class schedule is a work in progress, but was last updated October 15. The dates and school holidays are correct for Fall 2015, but the topics and order of topics may change.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Wk** | **Date** | **Topic** | **Reading** | **Slides (pdf)** | **Assignment** |
| 1 | 17-Aug | Introduction & Class Overview | ID 1, 2 | [**PDF**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/pdf/1A-introduction.ppt.pdf) |  |
|  | 19-Aug | History of HCI and Evidence-Based Design |  | [**PDF**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/pdf/1B-history.ppt.pdf) | [**Start P0**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/project.html) |
|  | 21-Aug | Theory of Transdisciplinary Teams: Structure and Formation |  | [**PDF**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/pdf/Teams-Science-01.ppt.pdf) |  |
| 2 | 24-Aug | Frameworks IRB Online Training (upload certificate to t-square) | DOET (Optional) | [**PDF**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/pdf/2A-frameworks.ppt.pdf) [**PDF**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/pdf/2-doet.ppt.pdf) | **[CITI IRB Training](http://www.citiprogram.org" \t "_new)** |
|  | 26-Aug | UCD Process | UYU 1, 2, 3 | [**PDF**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/pdf/2B-UCD-overview.ppt.pdf) |  |
|  | 28-Aug | Usability Principles, Some Examples |  | [**PDF**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/pdf/2C-usability-principles.ppt.pdf) | [**P0 due, Start P1**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/project.html) |
| 3 | 31-Aug (T) | Know Your User - Context, Abilities, Perception, Action | ID 3 | [**PDF**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/pdf/3A-know-your-users1.ppt.pdf) | [**Start H1**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/assignments.html) [[**PANEL 1**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/project.html#PANEL)] |
|  | 2-Sep (T) | Team Brainstorming |  | [**PDF**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/pdf/Teams-Creativity.pdf) |  |
|  | 4-Sep (T) | Know Your User 2: Thinking, Wants, Needs, Society |  | [**PDF**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/pdf/3B-know-your-users2.ppt.pdf) |  |
| 4 | 7-Sep | **No Class** | School Holiday - Labor Day |  |  |
|  | 9-Sep | Universal & Inclusive Design Requirements Definition Methods: Observation, Interviews, Surveys; Task Analysis -- Applications to your Project | UYU 4, 5, 6, 7, 8; ID 7, 8, 9, 10 [**Handbook Chapter**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/extrareading/taskanalysis.pdf) | [**PDF**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/pdf/4A-universal-design.ppt.pdf)  [**PDF**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/pdf/4B-requirements1.ppt.pdf) | H1 due |
|  | 11-Sep | Requirements Definition 2: Needs Analysis & Focus Groups; etc., etc. -- Applications to your Project | UYU 9, 12 | [**PDF**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/pdf/4C-requirements2.ppt.pdf) |  |
| 5 | 14-Sep | Evidence-based Resources for Design: Predictive Motor &Cognitive Models | ID 15; [**CMN paper**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/extrareading/cmn23-44.pdf); [**MacKenzie on Fitts' Law**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/extrareading/fitts.pdf) | [**PDF**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/pdf/5B-user-models1.ppt.pdf) | [**Start H2**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/assignments.html#H2) |
|  | 16-Sep | Evidence-based Resources for Design 2: Descriptive Models | [**Nardi paper**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/extrareading/nardi.pdf) | [**PDF**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/pdf/5C-user-models2.ppt.pdf) | [**P1 due, Start P2**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/project.html) |
|  | 18-Sep | Information Architecture  *C. Gaylor* | [**Wurman's 'Hats' article**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/extrareading/DQ-145_Hats.pdf) | [**PDF**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/pdf/5D-info-architecture.ppt.pdf) |  |
| 6 | 21-Sep | Design 1 | ID 11 | [**PDF**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/pdf/6-design.ppt.pdf) | [[**PANEL 2**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/project.html#PANEL)] |
|  | 23-Sep | Design 2 | [**How Apple Built 3D Touch**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/extrareading/How_Apple_Built_3D_Touch-Bloomberg-2015-09.pdf) |  |  |
|  | 25-Sep  (T) | Design 3: Physical Forms  *Prof. R. Ball* |  |  | H2 due |
| 7 | 28-Sep | **Project POSTER Session** |  |  |  |
|  | 30-Sep | Prototyping 1: Software  *B. Tomlinson* |  | [**PDF**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/pdf/7A-prototyping1.ppt.pdf) |  |
|  | 2-Oct (T) | **EXAM** |  |  |  |
| 8 | 5-Oct (T) | Prototyping 2: Physical Forms  *N. Posner* |  | [**PDF**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/pdf/7B-prototyping2.ppt.pdf) | [**P2 due, Start P3**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/project.html) |
|  | 7-Oct (T) | Prototyping #3: Hybrid, Electronic, Electric  *Prof. G. Abowd* |  | [**PDF**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/pdf/7C-prototyping3.ppt.pdf) |  |
|  | 9-Oct | Interaction Styles: WIMP, Gestures/Touch, Direct Manipulation/VR/AR | ID 6; [**LAZAR CH6**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/extrareading/Lazar-CH6ScreenReaders.pdf) [**LAZAR CH14**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/extrareading/Lazar-CH14GestureInput.pdf), [**LAZAR CH17**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/extrareading/Lazar-CH17AccessibilityOfForms.pdf) | [**PDF**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/pdf/8A-interaction-styles.ppt.pdf) |  |
| 9 | 12-Oct | **No Class** | Fall Break |  |  |
|  | 14-Oct | Interaction Styles, cont'd: Speech  *S. Cantrell* |  | [**PDF**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/pdf/8B-interaction-styles-speech.ppt.pdf) | [[**PANEL 3**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/project.html#PANEL)] |
|  | 16-Oct | Universal Design & Assistive Technology: Accommodations, Mods, Customizations  *C. Phillips* |  | [**PDF**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/pdf/9A-assistive-technologies.ppt.pdf) | [**Start H3**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/assignments.html#H3) |
| 10 | 19-Oct | Evaluation 1  *D. Henneman* | ID 12, 13, 14 | [**PDF**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/pdf/10A-evaluation.ppt.pdf) |  |
|  | 21-Oct | Evaluation 2 |  |  |  |
|  | 23-Oct | Evaluation 3 - Special populations, circumstances | [**Lazar, Heng & Hochheiser CH14 & CH15**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/extrareading/LazarFengHochheiser-CH14-and-Ch15.pdf) |  |  |
| 11 | 26-Oct (T) | Errors | TBD | [**PDF**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/pdf/11B-errors.ppt.pdf) | [**H3 due, Start HW4**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/assignments.html#H4) |
|  | 28-Oct (T) | International(ization) Issues  *R. Arriaga* | [**LAZAR CH18**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/extrareading/Lazar-CH18InternationalizingGreenstone.pdf) | [**PDF**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/pdf/11A-international.ppt.pdf) |  |
|  | 30-Oct (T) | Business Models for Innovation  *K. McGreggor* |  |  |  |
| 12 | 2-Nov | Help & Documentation | [**Denon Manual**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/extrareading/AVR-791-OM-E_009.pdf) | [**PDF**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/pdf/11C-doc-help.ppt.pdf) | [**P3 due, Start P4**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/project.html) |
|  | 4-Nov | Audio 1 | [**Nees & Walker 2009**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/extrareading/NeesWalker2009-auditory-displays.pdf) | [**PDF**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/pdf/12-audio.ppt.pdf) |  |
|  | 6-Nov | Audio 2 | [**Nees & Walker 2011**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/extrareading/NeesWalker2011-invehicle-audio.pdf) |  |  |
| 13 | 9-Nov | Mobile/Ubicomp Issues 1 |  | [**PDF**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/pdf/12-mobile-ubicomp.ppt.pdf) |  |
|  | 11-Nov | Mobile/Ubicomp Issues 2 |  |  |  |
|  | 13-Nov | Affect and Emotion 1 | ID 5 | [**PDF**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/pdf/13-emotion.ppt.pdf) |  |
| 14 | 16-Nov | Affect and Emotion 2 |  |  |  |
|  | 18-Nov | Data Analysis, Synthesis, Interpretation |  | [**PDF**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/pdf/14A-data-analysis.ppt.pdf) |  |
|  | 20-Nov | Data Presentation, Use in Iterative Design | UYU 14 | [**PDF**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/pdf/14B-data-presentation.ppt.pdf) | [**HW4 due**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/assignments.html#H4) |
| 15 | 23-Nov | Information Visualization |  | [**PDF**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/pdf/14C-infovis.ppt.pdf) |  |
|  | 25-Nov | **No Class** | Thanksgiving Break |  |  |
|  | 27-Nov | **No Class** | Thanksgiving Break |  |  |
| 16 | 30-Nov | CSCW and Technology for Teams | ID 4; [**LAZAR CH8**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/extrareading/Lazar-CH8PeerTechnologyAutism.pdf) | [**PDF**](http://sonify.psych.gatech.edu/~walkerb/classes/ms-hci/pdf/15-CSCW-tech-for-teams.ppt.pdf) |  |
|  | 2-Dec | **WEDNESDAY: Project Final POSTER Session #1** | During regular class time (or, rather, 1-3pm) |  |  |
|  | 3-Dec | **THURSDAY: Project Final POSTER Session #2** | During MS-HCI Seminar time slot (4-6pm) |  |  |
|  | 4-Dec | Course Wrap-up and Review |  |  | P4 due Friday last day of classes at NOON |
| 17 | 07-Dec | **FINAL EXAM** | Date: MONDAY Dec 7, 2015, 3:00-6:00pm |  | **[Finals Schedule](http://registrar.gatech.edu/students/exams.php" \t "_new)** |

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