HUMAN-COMPUTER INTERFACE TECHNOLOGY

COS 436 / ELE 469: Princeton University Spring 2013

GENERAL INFORMATION

Lectures: Tuesday and Thursday 3:00–4:20 PM, Computer Science 104
Labs: Monday 1:30–4:20 PM, EQuad F114
Wednesday 7:30–10:20 PM, EQuad F113 and F114
Friday 1:30–4:20, EQuad F114

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Web: http://www.cs.princeton.edu/courses/archive/spring13/cos436

Office Hours: TBD; announced by second week of class.

DESCRIPTION and OBJECTIVES

COS 436 / ELE 469 will introduce you to the hardware and software technologies employed in the creation of human-computer interfaces, and to the field of human-computer interaction (HCI) more broadly. The course will help you develop a solid understanding of the concepts and practices of HCI, expose you to current research topics in human-computer interaction and interfaces, and provide you with practice designing, implementing, and evaluating interactive human-computer systems. These experiences should be valuable to students whose careers will involve creating technologies to be used by humans, and to students who pursue graduate work in HCI or other areas of computer science.

Upon completion of the course, you will:

- Have a basic understanding of the history and scope of the field of human-computer interaction.
- Be familiar with human-computer interaction beyond familiar desktop and GUI environments, including tangible user interfaces, "natural user interfaces," and ubiquitous computing; you will also be familiar with the hardware and software technologies employed in these interfaces.

- Be capable of implementing new tangible and physical user interfaces using microcontrollers, sensors, and actuators.
- Be familiar with significant trends in HCI research, and with basic HCI research methods
- Understand methods for evaluating and improving human-computer interfaces.
- Have hands-on experience designing, prototyping, refining, and evaluating human-computer interfaces.
- Have an online project portfolio showcasing your accomplishments in the course

IMPORTANT DATES

18 March:	Spring break week, no class!
14 May:	Dean's Date, final project materials due 5:00 PM. **No late submissions.**
16–17 May:	Poster presentation sessions. Time TBD this week. Invite your friends!

PREREQUISITES

The course is open to students of any major who have successfully completed COS 217, or with permission of the instructor. All students should be comfortable programming in some language (e.g., Java, C++, Matlab).

No prior experience with HCI or electronics is necessary. If you have significant electronics experience, you may find the first labs quite easy. If that's the case, please help teach others, and be commensurately more creative with your lab projects!

TEXTBOOK AND RESOURCES

We will be using *Physical Computing: Sensing and Controlling the Physical World with Computers*, by O'Sullivan and Igoe (2004).

This book only covers a fraction of material we will discuss in class. Occasional readings will be assigned at the beginning of the semester. After that, the book will be a useful reference for the labs and final projects.

Please see the course website for a list of other resources that may be helpful in learning more about the topics covered in the course, working with Arduino, sketching, analyzing user study data, etc.

COURSE ORGANIZATION

Format: Tuesday and Thursday lecture sessions will consist mainly of lectures, with some in-class group activities and possibly in-class assignments. Labs provide time for

you to work on the lab assignments and group projects. You may work in the labs at other times, as well.

Components of your grade:

- Individual assignments: 15%
- Group lab assignments: 20%
- Group design project: 40%
- Take-home final exam: 20%
- Attendance and participation: 5%

Schedule:
Please see the course website for the schedule of lectures, assignments, due dates, etc. Any changes to the schedule will be announced in class and/or on Piazza.

Attendance and Participation:
Your attendance is especially important given that much of the lecture material is not covered in the course textbook. We may take attendance or do in-class assignments throughout the semester.

We also expect you to participate on Piazza and the course blogs by helping answer your peers' questions, participating in meaningful online discussion, and/or sharing relevant resources with the class.

PROJECTS AND GROUP WORK

You will be working in groups of 4 on all labs and project components. Because this is a huge class, please do not form groups of 3.

Please stay in the same lab group beginning with Lab #1. If you feel you **must** change lab groups, please talk to the instructor first.

Each group will receive a lab kit, which you will return at the end of the semester. More information about lab kit and lab policies will come in another handout.

Because so much of you coursework will be done in teams, part of your design project grade will be based on teammate- and self-assessments of your contribution to your group. Components of your team contribution grade include the quality and quantity of your individual work, your ability to interact effectively with your team members, your efforts to keep the team on track and produce quality work, and your contribution of knowledge and skills to the group. You will assess yourself and your teammates against these criteria twice during the semester.

MISC. PRACTICAL INFORMATION

Piazza: If you have a question about any aspect of the course, please use the course Piazza site. If possible, please make your question "public" to other students (you can remain anonymous to them), since it's likely others will have the same question. Please do not e-mail the instructors directly unless necessary, since that's less efficient for us.

Feel free to also use Piazza for discussion of any topics related to class.

Anonymous feedback: If you have feedback or suggestions regarding any aspect of the course, feel free to use the anonymous feedback online form. The URL is posted in Piazza.

Peer Grading: The size of COS 436 has increased 600% since it was last taught! In order to ensure that you are still able to obtain detailed, thoughtful feedback on your work, we will be utilizing peer grading for several components of the course. We will do our best to ensure that this is a fair process for everyone, and we expect that your overall experience as a student will be enhanced by the opportunity to give and receive detailed feedback. If you have any concerns about the process, however, please come talk to us. You are free to opt out of peer grading at any time without penalty.

Deadlines: Due to the large size of the class, we need to be very strict about enforcing lab and assignment deadlines. No extensions will be granted. Late work will lose one full letter grade per day without approved medical/emergency documentation. For the purposes of electronic submissions, each day begins at 12:01 AM.

COLLABORATION and ACADEMIC INTEGRITY

Discussion and collaboration with your classmates is generally fine. Please prepare individual assignments and written work on your own, unless otherwise noted in the instructions.

Please do not directly copy code from the Web for use in the completion of your lab assignments, unless the assignment states otherwise. You are encouraged, though, to make use of circuit diagrams, tutorials, YouTube videos, and other online resources, as well as your textbook.

In your final projects, you may end up wanting to use code from various other sources (e.g., code you find online, third-party libraries, code you wrote in another class). This is alright as long as you tell us in writing (e.g., in a README file submitted with your project) what code is not yours and where you got it, and you also clearly indicate in your code itself (using comments) which code is not your own original work. This will enable us to grade you on the basis of your original contributions, and it will enable you to abide by the guidelines of Princeton's policies on academic integrity.

Even if you draw on existing code, circuit diagrams, tutorials, or other resources to help you implement your final project, your final project must have a significant component that is unique to this class. Ask us early if you have any questions.

FINAL REMARKS

COS 436 has been completely overhauled this year in order to accommodate new technology and a much larger class size. We promise to do our best to make things run smoothly, but if you have suggestions along the way for improving the course contents or logistics, please tell us!

For 2013, COS 436 has borrowed material and ideas from many great HCI instructors, including Perry R Cook (Princeton, Emeritus), Scott Klemmer (Stanford), Scott Hudson (Carnegie Mellon), Maneesh Agrawala (UC Berkeley), Bjoern Hartmann (UC Berkeley), James Fogarty (University of Washington), and Kimiko Ryokai, Elizabeth Goodman, Patrick Goodwill, and Reza Naima (UC Berkeley). If you like what you see here and want to learn more, please check out their course homepages (and their graduate programs!)

Last updated 02/06/13.