CS4474/CS9552: Human-Computer Interaction

Course Description

This course provides an overview of a number of areas in human-computer interaction (HCI). Broadly speaking, HCI is an interdisciplinary area concerned with the design, evaluation, and implementation of interactive systems for human use and with the study of major phenomena surrounding them. HCI addresses any interaction with computers by humans, as developers or as users, as individuals or as groups. On completion of the course, students are expected to have theoretical knowledge of and practical experience in the fundamental aspects of designing, implementing, and evaluating interactive systems that are useful and usable. Design of usable technology draws extensively on knowledge of informatics, cognition, communication, and computation. It is expected that students will become familiar with some of the literature in HCI and develop sufficient background in HCI issues to do more advanced work in this area.

This course consists of 3 lecture hours per week, reading assignments and presentations, in-class discussions, a team-based project, and some tests and quizzes. **In consultation with the instructor, graduate students may opt out of the tests and write a major research paper.**

Lecture and Instructor Information

Time	Room	Instructor	Office	Email
Mon 2:30−5:30 pm	NCB-113	Dr. Kamran Sedig	MC 420	sedig@uwo.ca

Prerequisite Requirements

Students enrolled in this course are likely final-year undergraduate or first-year graduate students. They are expected to have a strong understanding of programming and development tools. Having taken courses in cognitive science or psychology of thinking can be helpful for this course, but not necessary. *Since this is an interdisciplinary course, students from other departments who do not have knowledge of programming are permitted to take this course, particularly graduate students in Library and Information Science, Media Studies, or Health Information Science. They will work in teams whose members have programming expertise.*

Course Structure

This course will be both lecture- and project-based. Students will work in teams of 4 to 6 people on a term-long course project. The project will give students practical experience in several HCI issues. Each team will conceive, design, prototype, and evaluate an interactive software system. Theoretical assigned readings as well as class lectures will provide students with the foundation to work on their projects. **Although the project is an important component of the course, it is not the whole course.** The project provides an opportunity to see how theoretical concepts have practical applications. In addition to the practical component of the course, students are expected to study and understand the theoretical principles and concepts.

Initially, students will be put in teams to work on their projects. Then they will select a project in consultation with the instructor. Each team must write a short report describing the team members and the proposed project. Each team will then develop its design concept further; design and prototype; perform a usability evaluation; write a report; and make a class presentation. See the Course Evaluation section below for more details on each component of the project.

Required Course Materials

There are **two required books** that every student in the course must study.

DMM: Johnson, J. (2013). *Designing with the Mind in Mind: Simple Guide to Understanding User Interface Design Guidelines* (2nd Edition). Morgan Kaufmann. (available through Amazon.ca)

UPD: Lidwell, W., Holden, K., & Butler, J. (2010). *Universal Principles of Design: 125 Ways to Enhance Usability, Influence Perception, Increase Appeal, Make Better Design Decisions, and Teach through Design.* (available through Amazon.ca) – See end of this document for chapters for which you are responsible.

Copies of the lecture notes will be made available for students through OWL.

Learning Objectives

- To identify and describe HCI concepts/terminology/issues used in the design and evaluation of interactive computing systems
- To relate cognitive engineering concepts and principles to the design and evaluation of interactive computing systems
- To design human-centered software, consciously incorporating and applying the discussed HCI principles in the design process
- To evaluate the effectiveness of a piece of software in the light of the discussed HCI principles
- To think deeply about users' needs and distinguish the differences between system-centered design and human-centered design

Course Website

Students should check OWL (http://owl.uwo.ca) on a regular basis for news and updates. This is the primary method by which information will be disseminated to all students in the class, and by which assignments will be submitted. Students are responsible for checking OWL on a regular basis.

Course Evaluation

The overall course grade, out of 100, will be calculated as listed below.

Component	Value
3 1-Hour Tests (Multiple-Choice) -- ***Best 2 out of 3***	40% (individual mark – 2 * 20%)
5 10-Minute Pop Quizzes -- ***Best 4 out of 5***	8% (individual mark – 4 * 2%)
Reading Assignments	8% (individual mark)
Group Project	48% (group mark)
Team profile & Application/topic proposal	*1%*
Design (creation of complete storyboard and script of the application)	*4%*
Complexity of the application	*4%*
30+ design principles used in the app	*12%*
Full error-free implementation	*14%*

Final report (including evaluation)
    Executive summary   *(1%)*
    Navigation map of app   *(3%)*
    List of all 30 design principles
    used in the app, reference, &
    their location in the app   *(3%)*
    Heuristic evaluation of app   *(3%)*
	10%

Presentation	*2%*
Peer Evaluation	*1%*
Best Project (Bonus mark)	*3%*

Anticipated Lecture Topics

Although this course will cover many topics, some of those that will be discussed include the following:

- Framework for designing interactive systems
- Human-centered interactive systems design
- Usability and usability evaluations
- Principles of design
- Metaphors in design
- Conceptual models

Email Policy
All course-related emails should come from OWL. **No emails from other accounts will be read or accepted.** Also, any email you send should have "CS4474: <subject>" in the subject line (**e.g., CS4474: Project Proposal**). Otherwise, you may not receive a reply. Make sure to check-mark the "Send a copy of this message to recipients' email address(es)" when you send me an email. I generally answer emails within 5 days, depending on the volume of emails I have received during that week. However, I always try my best to reply to your emails as soon as I can. Please do not expect replies to emails during weekends.

I will occasionally need to send email messages to the whole class, or to students individually. Email will be sent to your UWO email address. You must make sure that you read your email on a frequent and regular basis, or have it forwarded to an alternative email address if you prefer to read it there. However, remember that your UWO email may have quotas or limits on the amount of space available. If you let your email accumulate there, your mailbox may fill up and you may lose important email from your instructors. Losing email that you have forwarded to an alternative email address is not an excuse for not knowing about the information that was sent.

All submissions
Each submission should include a cover sheet which includes: heading (e.g., Project Proposal), title (e.g., name of your project), course number, date, and **alphabetical** list of names (Last, First) of all students in the team. Make sure you do NOT include your ID numbers. All submissions are also to include a blank page where I will record my mark. You will give me all your submissions in an electronic form through the OWL system and will receive them back through the OWL system. The file names should follow the general protocol below: SUBMISSION_HCI_Group# (e.g., ProjectProposal_HCI_Group3).

Reading Assignments
It is **imperative that you keep up with the assigned readings**. A good understanding of the material from the readings is essential if you want to do well on your projects and in the course. This course requires you to comprehend the readings and be able to apply them intelligently to your designs. To help you keep up with the reading material, you are required to submit a summary of the assigned readings **every week**, starting from the second week **(15th of January)**. The main purpose of these readings is to help you keep up with the course and be organized for the pop quizzes, the tests, and the project. Those who do not submit their summaries will receive a zero mark for that week. All other submitted summaries will receive a full mark. These summaries **will not be returned** to you.

Summary Format and Content
The summary should **highlight and present the main issues or concepts** discussed in the readings, and it should be based on *your own* reading of the text. *A summary that is merely a copy of material from the textbook will be assigned a mark of zero.* The length of the summaries is not important; what matters is that you have expressed the content in your own words. Your summaries should include a cover sheet with your name, the textbook name and chapter number(s), course number, and date. Summaries should be submitted electronically through OWL **before 11:30 PM** of the day on which they are due. Create a folder in your dropbox and label it as Readings_LastName_FirstName (e.g., Readings_Smith_Joe). Reading summaries should be placed in this folder. The summaries are to be single-spaced, no less than 1 full page, and in an 11-point font of Times New Roman. File name should have the following fromat: Reading#_HCI_LastName_FirstName (e.g., #1_HCI_Smith_Joe) . If this file format is not followed, your assignment will be discarded.

Tests & Quizzes
Material for test or quiz questions will be drawn from **all of the following**: lecture notes, assigned readings, discussions from class, and any notes written on the board during lectures. **If you miss a lecture it is your responsibility to find out what was covered.** No electronic devices may be in your possession during the exams.

Tests and quizzes will contain multiple-choice and/or short questions. You are responsible for, and need to study, all lecture notes and assigned readings up to and including the week prior to each quizz. Marks will be available within 2 weeks of the test or quizz.

It is Faculty of Science policy that a student who chooses to write an exam deems themselves fit enough to do so, and the student must accept the mark obtained. Claims of medical, physical, or emotional distress *after the fact* will not be considered.

Course Schedule & Reading Assignments

Date	Your Task
Jan. 8	(none) First lecture
Jan. 15	DMM 1, 2, 3
Jan. 22	DMM 4, 5, 6 + Project team profiles & proposals due
Jan. 29	DMM 7, 8, 9 + Test#1
Feb. 5	DMM 10, 11, 12
Feb. 12	DMM 13, 14, 15, Appendix + Project designs due
Feb. 19	(none) Reading week
Feb. 26	UPD Part 1: How can I influence the way a design is perceived? + Test#2
Mar. 5	UPD Part 2: How can I help people learn from a design?
Mar. 12	UPD Part 3: How can I enhance the usability of a design?
Mar. 19	Test#3
Mar. 26	(none) + Course Overview + Q&A
Apr. 2	Project presentations
Apr. 9	Project presentations + Final prototypes & reports due

Team Project

In teams of 4 to 5 people (depending on the number of registered students), you will design and implement a small-scale application. The project will have **6 deliverables**: 1) team profile and proposal, 2) design document (storyboard and script), 3) implemented prototype, 4) final report, 5) peer evaluation, and 6) final class presentation. **The most important thing about the project is for you to learn to consciously apply the theoretical concepts and principles of the course in your design.**

Teams

Teams will be created in the first two weeks of the course. Each team will be assigned a number. Once project teams are formed, there will be no movement of students from one team to another. If a student drops the course, that student's team will continue to exist, minus one member. In this event, the other members should talk to the instructor if they think they need to re-adjust the scope of their project. Final project presentations are according to team numbers. That is, Team 1 will present first, Team 2 will present next, and so on.

Peer evaluation

On the last day of classes, you will evaluate your team-mates or peers in terms of how cooperative they were, how much effort they put into the project, whether they attended your meetings, and so on. The project mark of students whose peer evaluation is **below 80%** will be adjusted to reflect their lack of participation in the project. That is, someone who gets 70% on peer evaluation will receive 70% of the total project mark for the group. Each student should get **at least 50%** on this component of the project to pass the course. **Please note:** Students who fail on their peer evaluation will automatically fail the course, unless, based on justifiable reasons provided by the student, the instructor judges otherwise. Each student will upload a peer evaluation form in their OWL dropbox. This form will contain the name of your teammates, excluding yourself, and a score ranging from 0 to 100% for each peer. The file will have the following name: ProjectPeer_Team#_LastName_FirstName. If this naming format is not followed, your file will be discarded.

Project Submissions

For your submissions, use a format that does not require special software (e.g., .docx, .ppt, .jpg). The team profile, proposal, design document, final report, and presentation will be submitted electronically through the OWL system. The prototype will be submitted on CD, DVD, USB drive, SD card, or any other means that you have cleared with the instructor ahead of time. This submission includes the executable and any related source files (e.g., source code, project files, images, etc.). Ideally, your prototype should run on a Chrome web page. Every effort will be made to have written submissions marked and handed back within 2 weeks of the hand-in date, and will usually be available sooner.

Team Profile and Application Proposal
This document has two parts: Team Profile and Application Proposal. In the team profile, you will identify your team members and provide a brief background of them (e.g., what other courses they have taken, knowledge of tools, etc.). In the proposal, you will identify and describe what you want to design (i.e., topic of your project), and the scope of your project. You need to make sure that your scope is manageable and that your team members have enough expertise to carry it out. This will be a maximum of 4 pages long. Only one person from your group will upload this file. The file will have the following name: ProjectProposal_Team#. If this naming format is not followed, your file will be discarded.

Design
In the design document, you have to come up with a detailed storyboard and script of your interactive system. This part of the project consists of two parts: an executive-level description of the goals of your system and the design.
Once you have decided what your design is like, you will develop your storyboards and scripts. These will be detailed drawings and descriptions of how your system will function—all the buttons, icons, transitions, etc. Try and make the storyboard such that I will be able to easily understand it. Your storyboard will be essential for the next phase and will make it easier for you to translate your design into an implemented system. Your design should be submitted as a file through OWL. The file will have the following name: ProjectDesign_Team#. If this naming format is not followed, your file will be discarded.

Prototype
The prototype will be a **fully-functional implementation** of your design as an interactive system. Your prototype will be based on your design. You can use any tool or programming language you like to implement your prototype. **Make sure you DO NOT spend time learning a new language or a tool to implement your design**. Use a tool that you know well so that you can concentrate **on design** rather than implementation issues.

Final Report
The final report will consist of the following 5 sections: an executive summary, a navigational map of your system, and a list of at least 30 design principles that you have used (with justifications), a final heuristic evaluation of the system, and your thoughtful recommendations for how the system can be improved in the light of your final evaluation. You will derive a set of evaluation heuristics from the course material and use it to evaluate your system. *Make sure that your report and the language you use are based on the concepts and ideas studied in the course.* The file will have the following name: ProjectReport_Team#. If this naming format is not followed, your file will be discarded.

Presentation
At the end of the term you will give a class presentation of your system. This presentation will be 30 to 40 minutes long, depending on the number of teams. For the benefit of the rest of your classmates, you will describe the evolution of your design: your motivation for choosing the project, your design, your prototype, and so on. You will do this collectively as a team. There will also be 10-15 minutes after your presentation for questions, comments, and class discussion. You will submit a copy of your presentation in electronic form through the OWL system. The file will have the following name: ProjectPresentation_Team#. If this naming format is not followed, your file will be discarded. **Note:** Your prototype does not need to be complete by the time of the presentation (see Important Dates below). If you want, your final report can be based on the state of the prototype at the time of the presentation to reduce the amount of work that you need to do. Also, you can bring snacks to share with others while you are doing your presentations. This is an informal presentation.

Project component marking scheme
Your mark for each component of the project will be based on a likert scale, as follows:

1.Extremely good: quality of work is exceptional; there are absolutely no flaws in the work; team has gone beyond the call of duty	100%
2.Very good: quality of work is very good; almost no flaws; team has worked very hard and demonstrates very good understanding of the studied material	90%
3.Good: quality of work is good; there are some aspects of the work which can improve	80%
4.Acceptable: quality of work is acceptable or fair; team did not put much thought into some parts	70%
5.Poor: quality of work is not acceptable; poorly based on any material studied in the course	60%
6.Very poor: component is very poorly done; many flaws; not based on material studied in the course	50%
7.Not delivered: component not completed	0%

Policy for late delivery of project components:
24 hrs: -10%; 48 hrs: -20%; 72 hrs: -30%; 96 hrs: -40%; 96 hrs+: -100%
Extensions may be granted only by the course instructor. If you have serious medical or compassionate grounds for an extension, you should follow the procedure for Academic Accommodation for Medical Illness as given below.

Academic Policies
The website for Registrarial Services is http://www.registrar.uwo.ca.

In accordance with policy, http://www.uwo.ca/its/identity/activatenonstudent.html,
the centrally administered e-mail account provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at his/her official university address is attended to in a timely manner.

Also note that electronic devices will not be permitted on tests and exams.

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:
http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_grad.pdf

Support Services
Students who are in emotional/mental distress should refer to Mental Health@Western
http://www.uwo.ca/uwocom/mentalhealth/ for a complete list of options about how to obtain help.
University Students' Council: http://westernusc.ca/services/

Accessibility
Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 x 82147 for any specific question regarding an accommodation.
http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_disabilities.pdf

Missed Course Components
If you are unable to meet a course requirement due to illness or other serious circumstances (including work that is worth less than 10% of the total course grade), you must provide valid medical or supporting documentation to the Academic Counselling Office of your home faculty as soon as possible *and* contact your instructor. It is the student's responsibility to make alternative arrangements with their instructor once the accommodation has been approved and the instructor has been informed. Such arrangements are likely to include time extension or reweighting of the Final Exam mark depending on when the assigned work was due.

If you are a Science student, the Academic Counselling Office of the Faculty of Science is located in WSC 140, and can be contacted at 519-661-3040 or scibmsac@uwo.ca. Their website is
http://www.uwo.ca/sci/undergrad/academic_counselling/index.html
A student requiring academic accommodation due to illness must use the Student Medical Certificate
(http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf) when visiting an
off-campus medical facility.
For further information, please consult the university's medical illness policy at
http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf
There will be **no makeup quizzes**. If you are going to miss an exam you must have notified the course instructor and filed documentation with your faculty's Academic Counselling Office at least 2 weeks prior to the exam. If you miss the midterm exam for a medical or other valid reason, and present valid documentation to your faculty's Academic Counselling Office, your other quiz marks will be reweighted to include the weight of the missed quiz. You must notify the course instructor within a week of the missed quiz.

Chapters from UDP for which you are responsible:

Part 1
How can I influence the way a design is perceived?

Part 2
How can I help people learn from a design?

Part 3
How can I enhance the usability of a design?