CS4474/CS9552: Human-Computer Interaction

Course Information
Title: Human-Computer Interaction (CS4474/CS9552)
Term: Winter 2020
Location: PAB-106
Lectures: Mondays 2:30 to 5:30PM

Instructor
Name: Dr. Kamran Sedig
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Course Description
This course provides an overview of a number of areas in human-computer interaction (HCI). Broadly speaking, HCI is an interdisciplinary subject concerned with the design, evaluation, and implementation of interactive systems for human use and with the study of major phenomena surrounding how humans work with technology. HCI addresses any interaction with computers by humans, as users or developers, as individuals or as groups.

This course consists of lectures, in-class practice studio work, reading assignments, presentations, and a team-based project. On completion of the course, students are expected to have theoretical knowledge of and practical experience in the fundamental aspects of conceptualizing, designing, and evaluating interactive systems that are useful and usable. Design of usable technology draws on knowledge of computer, information, cognition, and communication sciences. 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.

Learning Objectives
- To identify and describe HCI concepts/terminology/issues used in the design and evaluation of interactive computing systems
- To design human-centered software, consciously incorporating and applying 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

Structure and Method of Evaluation
This course is based on the experiential model of learning. It has both a theoretical component as well as a practical component. The theoretical component includes lectures and readings whereby students learn concepts, principles, and techniques. The practical component includes in-class practice studios, as well as a term-long project. The project is intended to help students apply the concepts and principles and get to reflect on their own and other people's practice. In this component, students work in teams. Teams get to design mock-up prototypes of different computer interface elements. Assigned readings as well as class lectures provide students with the foundation to work on their projects. Students are expected to study and understand the theoretical principles and concepts carefully. The project, and practice studios provide opportunities to see how theoretical concepts have practical applications. Another component, system presentation, is intended to deepen students' understanding by allowing reflection on systems and tools and how they have been designed.

Course Prerequisites
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.

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 is disseminated to all students in the class, and by which assignments are submitted.

Textbook
There is **one required textbook** that every student in the course must study.

Kent Norman (2017). *Cyberpsychology: An Introduction to Human-Computer Interaction (2nd Ed.)*. Cambridge University Press.
(available through Amazon.ca--Paperback or Kindle; may also be available at the university bookstore)

Some 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 evaluations
- Principles of design
- Metaphors in design
- Conceptual models

Method of Evaluation

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

Component	Value
5 Practice Studios	20% (group mark – 5 * 4%)
Reading Assignment Summaries	10% (individual mark)
Final Exam	35% (individual mark)
Group Project	35% (group mark) [+ 2% for best project]
Team profile & Application/topic proposal	*1%*
Design (creation of complete storyboard and script of the application)	*4%*
Final design *Degree of design complexity of app (how complex app is, how design principles are interwoven together, number of principles used [20+ principles], etc.)*	*10%*
Final implementation (Error-free)	*12%*
Final report (including evaluation) *Executive summary (1%)* *Navigation map of app (1%)* *List of 20+ design principles used in the app, with reference, & their location in the app (1%)* *Evaluation of app (3%)*	*6%*
Informal Presentation	*2%*
Peer Evaluation	*0%*
Best Project (Bonus mark)	*2%*

Marking scheme for each and every component and element of the course will be according to a 7-point Likert scale:

1.Extremely good: quality of work is exceptional; demonstrates great depth and breadth of understanding; there are absolutely no flaws in the work; beyond the call of duty. 100%

2.Very good: quality of work is very good; almost no flaws; demonstrates very good understanding. 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; not much thought has been put into some parts. 70%

5.Poor: quality of work is not acceptable; poorly based on any materials studied in the course. 60%

6.Very poor: component is very poorly done; many flaws; not based on materials studied in the course. 50%

7.Not delivered: component not completed. 0%

Course Schedule

The table below contains the schedule and due dates of the reading summariess, practice studios, and project components.

Date	Practice Studio # (75 mins)	Reading Summaries (Chap#)	Project
1/6			
1/13		1	
1/20		3	Team profiles & proposals
1/27		4	
2/3	1	7	
2/10	2	8	Designs (storyboard & script)
2/17			
2/24	3	9	
3/2	4	10	
3/9	5	11	
3/16		14	
3/23		19	
3/30			Presentation groups: 1, 2, 3, 4 Project final reports and prototypes
3/6			Presentation groups: 5, 6, 7, 8 Project final reports and prototypes

Email Policy

All course-related emails should come from OWL's Messages system. **No emails from other accounts will be read or accepted.** Also, any email you send should have "<subject>" in the subject line (**e.g., Project Initial Proposal**). Otherwise, you may not receive a reply. If you do send me an email, I generally answer 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.*

Lectures

Lectures will provide an overall formal framework for an understanding of the course materials. Lectures supplement the materials in the textbook. Lecture notes will be shared with you after each class. You need to study them carefully, as they provide you with the important concepts you need to know for your projects and practice studios.

Reading Assignment Summaries

You have weekly readings from the textbook. A thorough and deep understanding of the readings is essential if you want to do well in other components of the course. These readings will help you contribute to and participate in class discussions knowledgeably and effectively. To help you keep up with the reading materials, you are required to submit a **one-page summary** of the assigned readings every week (see **Course Schedule**). This summary should **highlight and present the main issues or concepts** discussed in the readings. You can do these summaries in whatever manner you think helps you understand the concepts. Those who do not submit their summaries will receive a zero mark for that reading summary. Those who submit their summaries will receive a full mark. These summaries **will not be returned** to you. You can calculate your mark for this component based on the number of summaries that you submit.

Practice Studios

To help you apply the concepts and principles and get to reflect on them, you will work in randomly assigned teams to do 5 in-class analysis, design, and evaluation practices (see **Course Schedule**). In these studios, you will have to demonstrate a deep understanding of the studied materials when conceptualizing and analyzing issues. For these studios, all members of the team should have kept up with and studied **all the readings and lecture notes** carefully and be able to participate in group activities.

You will be given one or more problems. As a group, you will create one or more solutions and/or systems. You will do some hand-drawn solutions/designs and generate a set of slides for a presentation at the end of the studio time using PowerPoint. This

presentation will cover two parts: First, you will present an introduction and analysis of the assigned problem. Second, you will present your solution to the problem. You need to justify your decisions as how and why of your solution during this presentation. <u>Make sure to always have computers that have display (e.g., HDMI or VGA) ports or bring an adapter.</u> One of the groups, randomly selected, will present their solution at the end of each session.

Marks for this component will follow the general marking scheme (see above) and will be based on at least the following criteria:
- Analysis and understanding of the problem
- Incorporation of concepts, principles, and techniques covered in the course
- Correctness of the solution and/or design
- Quality of PowerPoint presentation

Project
This component of the course is structured to make you gain experience in designing new HCI systems by applying the theoretical concepts learnt in the course to a concrete problem. In teams of 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.**

Project Submissions
For your submissions, use a format that does not require special software (e.g., .docx, .pptx, .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.

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.

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 20 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.*

Presentation
At the end of the term you will give a class presentation of your system. This presentation will be 30 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. **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.

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.

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.

Best project
On the last day of classes, we will vote for the best project. The team that wins will get a 2% bonus mark. Each individual will rank projects, except for their own. The project with the highest score wins.

Final Exam
Final exam 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 exam.

The final exam will contain multiple-choice and/or short questions.

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.

Late Assignments
There will be a deduction of 10% per day for late assignments.

Electronic Device Policy
Computers during lectures and practice studios should *only* be used for the purpose of taking notes. Checking of one's email, chatting with friends, browsing social media, checking your phone messages, and similar activities are not accepted and may result in the loss of marks. Additionally, the use of other electronic devices (e.g., cell phones) is not allowed during lectures. **NOTE**: *You are to arrive to class at least 5 minutes before the class starts*. Late arrival is a sign of disrespect to others.

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/

Absences & Missed Course Components

For accommodation concerning absences, students should refer to:
https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Consideration_for_absences.pdf
There will be **no makeup assignments or exams**. 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), in consultation with the instructor, a missed component may be weighed.

Accessibility

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