CS4474/CS9552: Human-Computer Interaction

Course Information
Title: Human-Computer Interaction (CS4474/CS9552)
Term: Winter 2022
Lectures: Mondays 2:30 to 5:30 PM
Location: Zoom Meetings (synchronous – until January 31st and conditional upon further notice); in-person lectures to be held in NCB117
Zoom Connection:
https://westernuniversity.zoom.us/j/97045566087
Meeting ID: 970 4556 6087
Passcode: hciich

Prerequisites
CS3307

Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary 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, frameworks and techniques. Having taken courses in cognitive science or psychology of thinking can be helpful for this course, but not necessary.

Since, at least during the initial weeks, this course will be delivered online, having a laptop or a computer, a working microphone and webcam, and a reliable internet connection is necessary to be able to participate in this class.

Instructor
Name: Amir Haghighati (ahaghig3@uwo.ca)
Contact: course-related communications only via OWL's Messages
Office: MC 27D (in-person); Zoom (https://westernuniversity.zoom.us/my/amirhm)
Office Hours: Wednesdays 1:00 to 3:00 PM (by appointment and via Zoom)

Course Description
This course provides an overview of several 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 online, synchronous lectures, virtual 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 online lectures and readings whereby students learn concepts, principles, and techniques. The practical component includes online, 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.

Email Policy

All course-related communications should take place inside OWL's Message system. No emails from other accounts will be read or accepted. If you do send a message via OWL, the instructor and TAs will try to respond as soon as possible, but do not expect the answer to be immediate. Please do not expect replies to messages during weekends.

Lectures

Until January 31st, the official date announced by Western, online, synchronous lectures, through Zoom, 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. If there is a change in the delivery mode, i.e., from online to in-person, it will be announced via OWL.

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

Main resource: Sharp, Helen; Preece, Jennifer; & Rogers, Yvonne (2019). *Interaction Design: Beyond Human-Computer Interaction (5th Ed.)*. Wiley.

Other resources:

- Norman, Donald; Berkot, Peter (2011). *The Design of Everyday Things*. Basic Books.
- Norman, Kent (2017). *Cyberpsychology: An Introduction to Human-Computer Interaction*. Cambridge University Press.

Some Lecture Topics

Topics covered in this course include, and are not limited to, 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%)
3 Quizzes	30% (individual mark: 3×10%)
Reading Assignment Summaries	10% (individual mark)
Group Project	40% (group mark)
Team Profile & Topic/Application Proposal	2%
Preliminary Design (creation of a complete storyboard and script of the application)	6%
Final Design	10%
Final Implementation	12%
Final Report - Executive Summary (1%) - Navigation Map (1%) - Employed Design Principles (2%) - Evaluation (3%)	7%
Project Presentation	2%
Peer Evaluation	1%
Best Project	Up to 2% Bonus

Marking scheme for each and every component 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 is the timeline for this course and includes due dates for each component.

Date	Practice Studio # (75 mins)	Quiz # (45 mins)	Project Component	Reading Summary (Chapter #)
1/10				
1/17				1
1/24			Team Profile & Proposal	2
1/31				3
2/7	1	1		12
2/14	2		Design (storyboard & scripts)	4
2/21	Reading Week			
2/28		2		7
3/7	3			8
3/14	4			13
3/21	5	3		14
3/28			project group presentations: first half	16
4/4			Final project submission; project group presentations: second half	

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 above). 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.

Quizzes

There will be 3 quizzes during the class (see above). The main focus in these is to evaluate the application of concepts in group projects. The questions will be drawn from all of the following: lecture notes, assigned readings, discussions from class, and any other material discussed during the lectures. Questions will be related to and based on the content of your projects. Thus, the questions will have no universal answers. Your answers must be tailored to the specifics of each group's project. Details of individual projects will be considered in marking. If you miss a lecture or a group meeting, it is your responsibility to find out what was covered.

Each quiz will take no more than 30 minutes and may contain multiple-choice and/or short/long questions.

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 above). 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. 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.
During the online lectures, Zoom breakout rooms will act as your virtual space for the practice studio. Make sure to have a stable internet connection. 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 the 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, 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.

Most important about the project is 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 (.pdf). The team profile, proposal, design document, final report, and presentation will be submitted electronically through the OWL system. The prototype and its source code will be created and maintained on GitHub or GitLab platforms. Your prototype should run on a web page (should be a web application). 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 Topic/Application Proposal
This document has two parts: Team Profile and Topic/Application Proposal. In 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 document will be a **maximum of 4 pages long**.

Preliminary Design
In the preliminary design document, you must 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 they are easily to read. 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 single PDF file through OWL.

Final Design
Your final design will be assessed based on the final report and final implementation (prototype). All its elements should be clear to the instructor and the TAs.

Final Implementation (Prototype)
The prototype will be a **fully functional implementation** of your design as an interactive system. Your prototype will be based on your preliminary 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. You are encouraged to use a version management and collaboration system like GitHub or GitLab. You must **only submit a link** to your code repository in your final report.

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.* A link to your code repository should also be contained in this documents.

Presentation
At the end of the term you will give a class presentation of your system. The exact duration of this presentation is yet to be determined and announced based on the number of groups, but usually each group is given around 30 minutes. 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 all other components. You will do this collectively as a team. There will also be 5-10 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 project has to be finalized and submitted by the time of the presentation (see important dates above). Also, you can bring snacks to share with others while you are doing your presentations. This is an informal presentation.

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.

Late Submission Penalty
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.

Course Delivery and Assessment with Respect to The COVID-19 Pandemic
Although the intent is for this course to be delivered in-person to the extent possible, the changing COVID-19 landscape may necessitate some or all of the course to be delivered online, either synchronously (i.e., at the times indicated in the timetable) or asynchronously (e.g., posted on OWL for students to view at their convenience), as

deemed most appropriate by the instructor. The grading scheme will not change. Any assessments affected will be conducted online as determined by the course instructor.
When deemed necessary, tests and examinations in this course will be conducted using a remote proctoring service. By taking this course, you are consenting to the use of this software and acknowledging that you will be required to provide personal information (including some biometric data) and that the session will be recorded. Completion of this course will require you to have a reliable internet connection and a device that meets the technical requirements for this service. More information about this remote proctoring service, including technical requirements, is available on Western's Remote Proctoring website at: https://remoteproctoring.uwo.ca.

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.

Religious Accommodation
Students should consult the University's list of recognized religious holidays, and should give reasonable notice in writing, prior to the holiday, to the Instructor and an Academic Counsellor if their course requirements will be affected by a religious observance. Additional information is given in the Western Multicultural Calendar: https://multiculturalcalendar.com/ecal/index.php?s=c-univwo. You may also be eligible to write the Special Exam if you are in a "Multiple Exam Situation" (see http://www.registrar.uwo.ca/examinations/exam_schedule.html).

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_undergrad.pdf.

Please note that Zoom servers are located outside Canada. If you would prefer to use only your first name or a nickname to login to Zoom, please provide this information to the instructor in advance of the test or examination.

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

Support Services
Please visit the Science & Basic Medical Sciences Academic Counselling webpage for information on add/drop courses, academic considerations for absences, appeals, exam conflicts, and many other academic related matters: https://www.uwo.ca/sci/counselling/

Please contact the course instructor if you require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Student Accessibility Services (SAS) at (519) 661-2147 if you have any questions regarding accommodations.
Western University is committed to a thriving campus as we deliver our courses in the mixed model of both virtual and face-to-face formats. We encourage you to check out the Digital Student Experience website to manage your academics and well-being: https://www.uwo.ca/se/digital/.
Students who are in emotional/mental distress should refer to Mental Health@Western (http://www.health.uwo.ca/mental_health) for a complete list of options about how to obtain help.
Additional student-run support services are offered by the USC, http://westernusc.ca/services.