CS4474/CS9552: Human-Computer Interaction

Course Information

Title: Human-Computer Interaction (CS4474/CS9552)
Term: Winter 2024
Lectures: Mondays 2:30 to 5:30pm
Location: NCB 113

List of 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.

Instructor and Teaching Assistants

Instructor: Dr. K. Sedig
Email: All communication only via OWL
Office hrs: Mondays 1:00 to 2:00pm (by appointment)

TAs: Vladimir Zhurov (vzhurov3@uwo.ca) & Sanyam Jain (sjain284@uwo.ca)
Office hrs for TAs: to be determined

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 class discussions, practice studio work, reading assignments, presentations, and a team-based project. On completion of the course, students are expected to have strong 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 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 note, readings, and discussions 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 discussions provide students with the foundation to work on their projects. Students are expected to study and understand the theoretical principles and concepts carefully. Course notes are shared with you in advance which you have to study before attending classes. Class time will be used for discussing the notes and questions and answers. As such, regular attendance and engagement in discussions is essential to an understanding of the theoretical component of the course. The project, and practice studios provide opportunities to see how theoretical concepts and principles have practical applications.

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

Sharp, Helen; Preece, Jennifer; & Rogers, Yvonne (2019). *Interaction Design: Beyond Human-Computer Interaction (5th Ed.)*. Wiley. (available through Amazon.ca--Paperback or Kindle; may also be available at the university bookstore)

Other useful resources:

Johnson, J. (2014). *Designing with the Mind in Mind: Simple Guide to Understanding User Interface Design Guidelines*. MK.
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*.
Norman, D. (2013). *The Design of Everyday Things*. Basic Books.
Norman, K. (2017). *Cyberpsychology: An Introduction to Human-Computer Interaction*. Cambridge University Press.
Weinschenk, S. (2020). *100 Things Every Designer Needs to Know About People*. New Riders.

Some Topics

This course will cover many topics; some topics 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	15% (group mark: 5×3%)
5 Quizzes	40% (individual mark: 5×8%)
Reading Assignment Summaries	10% (individual mark: 10×1%)
Group Project	35% (group mark)

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.*

Course Notes and Class Discussions

Course notes and class discussions will provide an overall formal framework for an understanding of the course materials. They supplement the materials in the textbook. Course notes will be shared with you via OWL. This is not a lecture-based course. You need to study course notes carefully ahead of classes. Class time will be devoted to discussion and clarification of these notes. The notes also contain links to many videos to help you develop a deeper understanding of studied concepts. Understanding of the concepts covered in the notes is essential for you to do well in your quizzes, projects, and practice studios.

Since this is a large course and there will be a lot of class discussions about the studied materials, you are required to have name tags and wear them while attending classes.

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 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 course notes* carefully and be able to participate in group activities.

You will be given one or more problems. As a team, 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.

One or two teams will be randomly selected to present their solution at the end of each session.

Marks for this component will be based on at least the following criteria:

- Analysis and understanding of the problem: *1%*
- Incorporation of concepts, principles, and techniques covered in the course: *1%*
- Correctness of the solution and/or design: *1%*

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 to 6 people (depending on the number of registered students), you will design and implement a small-scale application. The project will have the following deliverables:

1. team profile and proposal,
2. implemented prototype,
3. final report,
4. peer evaluation, and
5. 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. Use only the following: .docx, .pptx, .jpg, and 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 submitted using GitHub platform. Ideally, your prototype should run on a web page (should be a web application).

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*.

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 TA(s).

Final Implementation (Prototype)
The prototype will be a *fully functional implementation* of your design as an interactive system. You can use any tool or programming language you choose with which 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 15 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 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 prototype does not need to be complete by the time of the presentation. 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.

Project marking scheme

Group Project	35% (group mark)
Team Profile & Application/Topic Proposal	*2%*
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 *Fully functional software*	*10%*

Final Report
    Executive summary (1%)
    Storyboard and script of app and how to navigate through the screens (3%)
    List of design principles used in the app, with reference to their location in the app (3%)
    Evaluation of app (3%)
	10%

Project Presentation	*2%*
Peer Evaluation	*1%*

Quizzes

There will be 5 quizzes during the class (see **Course Schedule**). The questions will be drawn from all of the following: course notes, assigned readings, discussions from class, and any other notes discussed during the lectures. Each quiz will take no more than 30 minutes and may contain multiple-choice and/or short/long questions. Some of the questions in these quizzes may be based on the application of concepts in group projects. Thus, such questions will have no universal answers. Answers must be tailored to the specifics of your projects.

Details of individual projects will be considered in marking. If you miss a class or a group meeting, it is your responsibility to find out what was covered. If you miss a quiz due to sickness, your marks on other quizzes will be distributed to cover for the missed quiz.

Late Assignments

Lateness for any component of any of your assignments will result in a deduction of 10% per day.

Course Schedule

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

Week	Date	Practice Studio # (75 mins)	Reading Summaries (Chapter #)	Quiz # (~ 30 mins)	Project Component
#1	1-8				
#2	1-15		1		
#3	1-22		2		
#4	1-29		3		Team profiles & proposals
#5	2-5	1	12	1	
#6	2-12	2	4		
#7	2-19	Reading Week			
#8	2-26		7	2	
#9	3-4		8		
#10	3-11	3	13	3	
#11	3-18	4	14		
#12	3-25	5	16	4	
#13	4-1				Final project submission; Project presentation groups
#14	4-8			5	Project presentation groups

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.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.

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.