CSC396Y Designing Systems for Real World Problems
Computer Science Summer Project 2023 – Study Abroad in Berlin

COURSE INFORMATION & COMMUNICATION

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Quercus application will be used for all course information & communication. **Email** via Quercus is the preferred method of communication with professor. Students should **NOT expect immediate email responses**. Attempts will be made to respond to emails in about 24 business hours.

NOTE: The University & Quercus communicate with students using **only university email addresses.** Please, make sure that your **ROSI email** is correctly set to your University email address, for example your.name@utoronto.ca or that you have created a **functioning forward** on this email address, to ensure **you do not miss important course related announcements.**

COURSE DESCRIPTION

Human Centered Design results in robust solutions that successfully address real human problems. The Summer Abroad provides students with an opportunity to explore new environments, which improves their ability to see their own world with increased sensitivity and germinates new design ideas. Students will **identify a real world problem** and **work in groups** on projects to address this problem. Students will begin by exploring their problem space and the people within that space, identifying users' needs, system constraints and requirements, and ultimately designing solutions that incorporate all those components. Designs will be iterated from initial concepts to really valuable solutions by gathering feedback and usability testing design prototypes with users throughout the course. The course projects will culminate with development of a robust design that addresses the identified problem. Final project presentations will take place at the end of the course. This course has no final exam.

COURSE OBJECTIVES

1. To introduce students to Human Centered Design, Design Thinking and User Experience Design. To introduce students to some research in these fields.
2. To give students experience in
   (a) exploring a problem space and thinking deeply about the space and the people impacted,
   (b) understanding target audiences, their current practices, and underlying needs,
   (c) iterating design ideas using various prototypes and thinking critically about designs from the users' point of view,
   (d) usability testing designs with real users and drawing implications from usability testing to improve the designs,
   (f) working in multidisciplinary design teams,
   (g) clearly and critically communicating research findings regarding usability of designs and user experiences in forms of presentations and reports.
3. To instill in students empathy for their future users, clients, and colleagues, in any work area.
4. To prepare the students for further work in related areas.

FIELD TRIP DETAILS

1. **Berlin City Walking Tour** will be conducted with a guide upon arrival in Berlin
2. Visit to **Berlin's Technology Museum** to see historical technological artifacts
3. Visit to **FUTURIUM** the house of futures
4. Visit to **Berlin's Musical Instruments Museum** to explore the evolution of musical technologies
5. Visit to Berlin's **DDR Museum** to explore life in the former East Germany
6. HALF DAY TRIP by local commuter train to Human Computer Interaction Laboratory in the **Hasso Plattner Institute at Potsdam University**, to see groundbreaking research projects there
7. TWO DAY TRIP to **Volkswagen Factory at Autostadt**, Wolfsburg, Germany with an overnight stay and a visit to the **Phaeno Science Museum**

COURSE OUTLINE

The course is delivered in a number of stages where students take a single project idea and develop it into a design following an iterative user-centered design process.

- Individually propose a **problem space**, not a specific problem just yet.
- Review the Toronto Transit system using industry established Heuristics
- Form groups and choose **one problem space** to focus on with your group.
- Individually conduct **research** and **literature review** of the chosen problem space.
- Compile research and choose **one specific problem** within the chosen problem space. Define your **target audience** and conduct **primary research.**
- Compile group research, analyze results, and develop **design guidelines.**
- Individually develop **low fidelity prototypes** (hand-drawn on paper or using low-fi tools).
- Informally **usability test** individual low-fi prototypes, analyze findings, and compile results.
- Combine individual insights to develop your group's **high-fidelity prototype(s)**.
- Formally **usability test** your high-fi prototype(s).
- **Update your design concepts** using insights from usability testing.
- Deliver **final design**, **documentation**, & project **presentation**.

In addition this course aims to develop students critical thinking regarding user experiences that surround them day-to-day. To achieve this, students will be asked to compare user experience aspects of **transit systems** in Toronto and Berlin.

This course is delivered through a combination of lectures, critique sessions, and project presentations. This course depends on a significant amount of successful **group work**. Students will be expected to form groups at the start of the course and to work in these same groups for the duration of the course. In past similar courses, groups with students from diverse disciplines have been quite successful in producing creative, robust, and viable projects; thus **multidisciplinary project groups are strongly encouraged.**

COURSE SCHEDULE ASSIGNMENTS & GRADES

This full year Computer Science credit course has demanding curriculum requirements compressed into a short time span of 4 weeks in Berlin. Thus, students will have the **first in-person class meeting**

in Toronto in **late April, date TBD**. Students will **complete assignments A0 through A4 prior to departing for Germany** while the rest of the assignments will be completed while in Berlin.

The course will follow the **Human/User Centered Design** approach that includes: **formative research** to explore the problem space and its current reality, **iterative design** to develop a solution in several phases with increasing detail using input from the target audience, and **summative research** to verify the proposed solution actually delivers on its promise. These components will comprise the core of the course making up 75% of the grade.

The final 25% will be awarded to **course participation**. This is a group project course so working successfully in a group is a requirement. The course participation grade will be determined by your contribution to group-work (using confidential evaluations from each group member) combined with the instructor's evaluation.

The group work component will be worth 50% of the course grade while the individual work will make up 50% of the mark, including 25% for participation.

DATES, ASSIGNMENTS, & GRADES

Due Dates **2023**	**CLASS #**	**Assign #**	**Group & Individual Work Assignments**	**Individual Work %**	**Group Work %**
Apr TBD		**A0**	**Post** Pitch a problem space and yourself to your class	•	
Apr TBD			IN-PERSON MEETING at Woodsworths College, April date TBD, INTRO CLASS & GROUP FORMATION		
May 16		**A1**	**Post** Heuristic review of Toronto Transit system	**3**	
May 30		**A2**	**Post** Group forms, problem space, individual research plans		**1**
May 30		**A3a**	**Post** Individual research paper proposal for approval, for A3	•	
June 13		**A3b**	**Post** Individual research plan & instruments for feedback	**2**	
July 11		**A3c**	**Post** Individual research results, paper review, Berlin expectations	**8**	
July 22			ARRIVE in BERLIN		
July 23			BERLIN City Walking Tour & Welcome Dinner		
July 24	**1**	**A3c**	First class in Berlin. **Present** Individual research, <2 mins timed	•	
July 25	**2**	**A4a**	**Present** Group combined results in class		**4**
July 26 July 27	 **4**	**A4b**	**Post** Group Design Requirements, Experience Map, UX Strategy, Low-Fi prototype plans **Present** A4b in class		**10**
July 31 Aug 1	**5** **6**	**A5**	**Post** Individual low-fi prototypes **In class** Usability test individual low-fi prototypes **Post** Individual low-fi test results. **Present** A5 in class: Individual low-fi test results	**10**	
Aug 6	**9**	**A6**	**Present** A6 in class: Group combined solutions, internal evaluations, functional prototype(s), & usability test plans		**15**
Aug 13 Aug 14	 **12**	**A7**	**Post** Group usability test results, & updated prototype(s) **Present** A7 in class		**10**
Aug 16 Aug 17	**13** **14**	**A8**	**Present** A8 Group Project in-class for practice and feedback **Present** A8 Final Group Project for guests. Last Class.		**5** **5**
Aug 17		**A9** **A10**	**Post** Usability Testing Reflection **Post** Peer review, Berlin retrospective, Course evaluation **Class Participation**	**2** **25**	
			TOTALS	**50**	**50**

IMPORTANT NOTES ABOUT ASSIGNMENTS & GRADES

Assignments: The course project is divided into a number of assignments, due regularly, starting with first deliverable being due on **Apr TBD** and then continuing until the end of the course time in Berlin**. All course deliverables are designed to build on top of each other; omitting any assignment would significantly disadvantage both the student and their group.** Individual assignments are to be completed, submitted for grading, and shared with other group members. Group components require analysis of individual work, synthesis, and integration into the larger group submissions and designs.

Late Policy: An assignment due at 11:59 PM if submitted at 12:05 AM is considered to be LATE. Submissions < 24 hours late incur a 25% penalty. Submissions < 48 hours late incur a 50% penalty. Submissions more than 48 hours late earn 0%. Exceptions to this policy are to be made only in extreme circumstances, with **communication in advance of the original deadline** and may require a medical certificate or similar document.

Remarking: Students requesting remarking of an assignment must do so in writing within 24 hours after receiving the assignment. Requests must include detailed reason & contact info. **Please note,** assignments submitted for remarking will be remarked fully and **may result in lower grades.**

WRITTEN WORK

Your ability to conceive of, design, and implement new tools and new designs that truly meet the needs of you target audience depends critically upon your ability to communicate with these users. This requires effective writing and speaking skills. All assignments include **substantial written work**.

Structure and organization, spelling, grammar, word usage, and document appearance will count for roughly 10% of your grade on the written work**. If assignments are not in satisfactory university-level English prose, they will be returned for rewriting.**

ACADEMIC OFFENCES

All the work you submit must be done by you (individually or within your group), and your work must not be submitted by anyone else. **Plagiarism is academic fraud and is taken very seriously.**
Read **Plagiarism in CS** http://www.cs.toronto.edu/~fpitt/documents/plagiarism.html and
Arts & Science Code of Behaviour https://governingcouncil.utoronto.ca/media/15068/view

PROTOTYPING SOFTWARE

For this course you will use **your own computer**, and the software of your choice. Your group's prototype must be **viewable** in **any standard Web browser.** In the past students have used Figma, Sketch, HTML, CSS, C++, Java, Invision, Adobe XD, and even PowerPoint to create their interactive prototypes. If you are planning to use any software not listed here please **discuss it with the instructor before starting.**

INSTRUCTOR BIO

ILONA POSNER is a User Experience (UX) Consultant, Coach, and Educator. Starting in the field more than 30 years ago, she has seen it evolve from Human Computer Interaction (HCI), to Usability, UX and now to User Experience Design. She is constantly striving to improve people's experiences with technology by focusing on human needs and business goals, while accommodating technological constraints. Crossing industry boundaries, she has consulted in large corporations and startups, in different verticals including technology, finance, telecom, healthcare, transportation, and education.

An experienced educator, Ilona Posner has been teaching User Experience since 2000, through project based design courses, at University of Toronto, OCAD University, and the Media Lab at the Canadian Film Centre, to hundreds of students, in both the graduate and the undergraduate programs. She teaches UX Certification courses for Human Factors International since 2003. She also develops and delivers custom training courses for industry. Ilona Posner has been volunteering with TorCHI, the Toronto Chapter of the Computer Human Interaction professional interest group and running international Student Design Competitions at International Conferences. Ilona holds a Master's Degree in Computer Science from the University of Toronto.

OPTIONAL COURSE EXTENTION – CSC494H

This portion of the Course Extension may be available to students who have developed viable design ideas in CSC394 and want to **fully develop their designs into functional products.** Students will need to ballot to qualify for this course extension.

What Students Said About This Course

This course has altered past students' view of the field of Computer Science and has given them a new perspective on the importance of their user. The skills students gain can be applied in many areas of Computer Science, product design, and beyond. Students commented after the course:

This course gives us a new concept of computer science, it's interesting and worth learning.

It is a very intersecting course that I think everyone should take. The workload is high.

This course is very beneficial but for those who want to get this credit easily, I don't recommend it. However, for people who want to learn about user experience, this course is super helpful.

Berlin is a great place to see and this course taught us an important way to look at creating projects.

They will learn a lot from it and get a well-designed project at the end of the course.

I learned a many skills that are very likely to be useful in my future career. My presentation skill has improved a lot. Although we need to answer questions and talk about own opinions in class, I don't feel uncomfortable to talk in class. Our professor is really nice. She read through our assignments very carefully, and always gave us useful and long comments. Because of her enthusiasm towards this course, we also feel that we want to put more effort on projects and make her happy :).