CSC396Y Designing Systems for Real World Problems
Computer Science Summer Project 2026 – Study Abroad in Berlin

WARNING: This is not a typical computer science course. There is a lot of written work and group work. If you want to learn a lot about UX, then take this course. **If you want a vacation & easy course, don't take it!**

COURSE INFORMATION & COMMUNICATION

Instructor – Prof. ILONA POSNER, ilona.posner@utoronto.ca
Teaching Assistant TBD???

Quercus will be used for all course information & communication. **Email** via Quercus is the preferred method of communication with the 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 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. There is 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 prototypes and thinking about designs from users' perspectives,
   (d) usability testing designs with real users and drawing implications to improve the designs,
   (f) working in multidisciplinary design teams,
   (g) clearly and critically communicating research findings regarding the usability of designs and user experiences in the form of presentations and reports.
3. To instill in the student's empathy for their future users, clients, and colleagues, in any work area.
4. To develop students' critical AI literacy, including understanding when AI tools appropriately support design work versus when human judgment and empathy are essential.
5. 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 **Berlin's Musical Instruments Museum** to explore the evolution of musical technologies
4. Visit to **FUTURIUM**, the house of futures
5. Visit to **Human Computer Interaction Lab** in the **Hasso Plattner Institute at Potsdam University**
6. TWO DAY OVERNIGHT TRIP to Wolfsburg to visit: the **phaeno Science Museum, Wolfsbüttel** 16th century town, **Autostadt, Automotive Museum,** and **Volkswagen Factory Tour.**

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 Usability Heuristics
- Form groups of 5 students and choose **one problem space** to focus on with your group.
- Individually conduct **research** and a **literature review** of the chosen problem space.
- Compile individual research findings and choose **one problem** within the chosen problem space.
- Define your **target audience** and conduct **primary research.** The target audience should be easy to reach either in-person or online during the course.
- Compile research findings as a group, analyze the 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 the findings, and compile results.
- Combine individual insights from usability tests to develop your group's **high-fidelity prototype(s)**.
- Formally **usability testing** 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. Students will need to reflect on their experiences in Berlin regarding the transit system and other aspects of their overall experience in Germany.

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 class will take place on ZOOM on Monday, May 4, 6-9 PM**. 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 75%.

This is a group project course so working successfully in a group is a requirement. The group work will be worth 50% of the course grade and the individual work will make up 50% of the mark, including 25% for course participation. The **course participation** grade will be determined by your contribution to group-work (using confidential peer feedback) and the instructor's evaluation.

DATES, ASSIGNMENTS, GRADES, & FIELDTRIPS, 2026

Dates	Class	Da	Assign	Group & Individual Work Assignments	Individual	Group
May 3		SU	**A0**	**Post** on Quercus: Pitch a problem space & yourself to your class	•	
May 4	**0**	M		**FIRST CLASS** on ZOOM, **May 4, 6-9 PM** & GROUP FORMATION		
May 12		T	**A1**	**Post** Heuristic review of Toronto Transit system	**4**	
May 26		T	**A2**	**Post** Problem space, research plans, group form & agreement		**2**
May 26		T	**A3a**	**Post** Individual research paper proposal for A3	•	
June 9		T	**A3b**	**Post** Individual research plan & instruments for feedback	**4**	
July 7		T	**A3c**	**Post** Individual research results, paper review, competitive analysis, Berlin expectations	**12**	
July 18		SA		ARRIVE in BERLIN & Check-in Hotel		
				Week 1		
July 19		SU		**Visit** Berlin **City Walking Tour** & Group Welcome Dinner		
July 20	**1**	M	**A3c**	First class in Berlin. **Present** Individual research, <1 min timed	•	
July 21	**2**	T	**A4a**	**Present** Group combined results in class **Visit** in Berlin - **German Museum of Technology**, afternoon		**4**
July 22	**3**	W	**A4b**	**Post** Group Design Requirements, Experience Map, UX Strategy, Low-Fi prototype plans		**10**
July 23	**4**	R		**Present** A4b in class: Group Design Req's & UX Strategy, Plans **Visit** in Berlin - **Musical Instruments Museum**, afternoon		
				Week 2		
July 27	**5**	M	**A5a**	**Post** Individual low-fi prototypes & usability test plans **In class** Usability test individual low-fi prototypes		
			A5b	**Post** Individual low-fi test results.		
July 28	**6**	T	**A5b**	**Present** A5b in class: Individual low-fi test results combined	•	
July 29	**7**	W		**In class** Internal Evaluations & **Group Accountability** Exercise **Visit** in Berlin – **Futurium** in the afternoon		
July 30	**8**	R		**In class** Functional Prototypes & Formal Usability Testing		
				Week 3		
Aug 2		SU	**A6**	**Post** Group combined hi-fi solutions & usability test plans		
Aug 3	**9**	M	**A6**	**Present** A6 in class: Group combined solutions, internal evaluations, functional prototype(s), & usability test plans		**15**
Aug 4	**10**	T		**In class** Discuss Usability Test Results & Human Perception		
Aug 5	**11**	W		**In class** Design Principles, **prepare questions for HPI** **Visit** HCI Lab at HPI Hasso Plattner Institute, in PM		
Aug 6	**12**	R	**A8**	**Present** A8 Draft Project Pitch in-class for practice & feedback		**4**
				Week 4		
Aug 9		SU	**A7**	**Post** Group Usability Test Report, & Prototype Updates		
Aug 10	**13**	M	**A7**	**Present** A7 in class: Usability Testing Report		**7**
Aug 11	**14**	T	**A8**	**Present** A8 Final Project Pitch for guests. Last Class.		**4**
			A9	**Post** Heuristic Eval, Research Reflections & Individual Journals, & Group Meeting Docs	**5**	**4**
			A10	**Post** Peer review, Berlin retrospective, Course evaluation	•	
				Class Participation, +2% Bonus marks	**25**	
Aug 12		W		**Visit Wolfsburg** depart early morning, STAY OVERNIGHT		
Aug 13		R		**Visit Wolfsburg all day**, return evening for Farewell Dinner		
				TOTALS	**50**	**50**

IMPORTANT NOTES ABOUT ASSIGNMENTS & GRADES

Assignments: To optimize the pace of learning in the class, one project is divided into smaller assignments, submitted throughout the course. The first deliverable is due before midnight on **May 3** and last deliverables on the last day. **All course deliverables are required and build on top of each other. Omitting any assignment would significantly disadvantage both the student and their group.** Individual assignments are to be completed individually, submitted for grading, and then shared with other group members. Group assignments require analysis of individual work, synthesis, and integration into a larger group submissions. Some assignments are graded, while others will receive feedback only.

Late Policy: An assignment due at 11:59 PM local time, if submitted at 12:05 AM is considered 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 grades. Requests must include detailed reason & contact info. **Please note,** assignments submitted for remarking will be remarked fully and **may result in lower grades.**

AI & UX

Course Philosophy on AI This course emphasizes human-centered design, where empathy, critical thinking, and unique human perspectives are essential. AI tools can support certain tasks, but cannot replace the human judgment and creativity at the core of UX design.

If you use any **AI Tools** in any assignment, **you must provide details** in the **Assignment Attribution section** and also include an **AI Appendix** with
(1) **WHY** you wanted to use the AI Tools
(2) **What PROMPT(s)** you used, and any iterations of these prompts, in the order they were used
(3) **AI RESPONSES** with highlights indicating any parts you used in your assignment
(4) **YOUR REACTION** satisfaction or dissatisfaction to the AI responses.
AI Appendix will **not count** towards the assignment's **page limit**.

Guidelines for Appropriate AI Use in This Course

- **Primary user research (interviews, observations, usability testing) must be conducted by humans with humans.** AI cannot replace direct human empathy and understanding.
- AI may be used to support literature reviews, competitive analysis, and generating initial brainstorming ideas. Any AI involvement must be attributed and documented.
- AI-generated design elements must be critically evaluated and iterated based on real user feedback.
- Your unique insights from user research and design iterations are what make your work valuable both in this course and in your future endeavors—these cannot come from AI.
- When in doubt about appropriate AI use for a specific assignment, ask the instructor before submission.
- **Important:** When using AI tools with **user research data**, ensure you do not input identifying information or sensitive data that could compromise **participant privacy.**

Approved AI Tools Currently, U of T-approved tools include:
- **Microsoft Copilot** (available to all U of T students) - approved for course-related work
- AI features within **Figma, Sketch, Adobe XD** - may be used with **proper attribution**
- Other tools require instructor approval and must comply with **U of T data security policies**

AI Literacy Development:
Throughout the course, students will develop critical AI literacy skills, including:
- Understanding when AI tools enhance vs. undermine learning in UX design
- Evaluating AI-generated content for bias, particularly in user research contexts
- Recognizing the irreplaceable value of human empathy in design processes

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. Assignments include **substantial written work and in-class presentations**.

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 OFFENSES

All the work you submit **must be original work done by you** individually or within your group. **Plagiarism is academic fraud and is taken very seriously, resulting in a ZERO grade or worse.** **WARNING**, using AI/ML/LLM augmented tools **without attribution** is considered to be Plagiarism. **Students must document all AI tool usage as described in the "AI & UX" section above.**
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, React Native, 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 **CONFIRM the acceptability of your chosen tools with the instructor BEFORE starting.**

ADDITIONAL RESOURCES

U of T AI & Teaching Resources: Students are encouraged to explore the following resources for responsible AI use:
- Centre for Teaching Support & Innovation (CTSI): AI in Teaching & Learning
  https://teaching.utoronto.ca/teaching-uoft-genai/
- Office of the Vice-Provost, Innovations in Undergraduate Education: Generative AI FAQs
  https://www.viceprovostundergrad.utoronto.ca/16072-2/teaching-initiatives/generative-artificial-intelligence/
- U of T Libraries: Generative AI Tools and Copyright Considerations
  https://onesearch.library.utoronto.ca/copyright/generative-ai-tools-and-copyright-considerations

INSTRUCTOR BIO

ILONA POSNER is a User Experience (UX) Consultant, Educator, and Coach. 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. 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 thousands of students, in both the graduate and the undergraduate programs. **2025 summer will mark the sixth round of CSC396 in Berlin.** 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 group and running Student Design Competitions at International Conferences. Ilona holds a Master's Degree in Computer Science from the University of Toronto.

TA BIO – ???

The Teaching Assistant will grade assignment submissions and provide detailed feedback.

OPTIONAL PROJECT EXTENSIONS – CSC494H & Beyond

Previous students' course projects have been accepted and funded in innovation incubator programs. CSC494 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:

"I would retake the course every year if I could. I find Berlin to intoxicating and the content we do is course fun and useful."

"I learned many skills that are very likely to be useful in my future career. My presentation skills have improved a lot."

"It is a very intersecting course that I think everyone should take."

"This course is very beneficial. 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 an important way to look at creating projects."

“I'll say that if the students want to enjoy their study in Berlin, I'll highly recommended this course. But if the students want to only have fun and experience an easy course, then I'll not recommended.”

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.

Reflecting allowed me to realize how much I have learned and grown throughout this journey and how I wouldn’t change a thing. I noticed the change in my outlook on certain things in life thanks to the perspectives, cities, people and trips I was exposed to in the course. I have become much better at presenting, taking and applying feedback, staying motivated despite challenges, and motivating the people around me.

Thank you, professor, for some wonderful discussions, challenging (but insightful) assignments, the snacks in class and overall, a very learnable environment!

I feel that I have gone on an interesting journey with my presentation skills in this course. I started out very nervous and slowly grew in both skill and confidence as the course went on.

I would definitely have taken this course; in fact, I would have been a lot more enthusiastic than I actually was. I loved the entire experience and I learned so much during the process.