Design of Assistive Technologies: Principles
Course Outline POTH-625D1/D2; Fall 2017 and Winter 2018

General Information

Course #: POTH 625D1/D2 **Section #:** 001 **Term:** Fall and Winter **Year:** 2017 and 2018

Course Schedule: Lectures are three hours per week on Friday from 3 – 6 pm

Number of credits: 3

Prerequisites: There are no formal prerequisites for the course. We seek students from a wide range of backgrounds and disciplines. Teams will be formed of three to four students who complement each other's skill sets. Many students are in Biomedical Engineering, Occupational Therapy and Physical Therapy, but students from all majors are welcome. This course is a good fit for students interested in public service, user-centred product design, working closely with a client with a disability, and tackling "wicked" real-world problems.

Sister courses: Students enrolled in this course will be attending class with students from BMDE 625 - "Design of Assistive Technologies: Principles and Praxis." Each project team will consist of students from both BMDE 625 and POTH 625. All students will be expected to contribute to the conceptual design of the project; BMDE 625 students will be responsible for the implementation of the conceptual design to create a final, deliverable assistive technology for the client.

Instructor Information

Name and Title:	Stefanie Blain-Moraes and Ross Wagner
Email:	stefanie.blain-moraes@mcgill.ca; ross.wagner@mcgill.ca
Telephone number:	514-398-1325
Office Location:	Davis House, DB6-B, Office hours by appointment

Calendar Course Description

Design of Assistive Technology: Principles and Praxis is an interdisciplinary, project-based course, centred around a design project in which small teams of students work closely with a person with a disability in the Montreal area to design a device, piece of equipment, app, or other solution that reduces their experience of disability.

Learning Outcomes

Upon completion of this course, the student will be expected to be able to:

1. Predict how design decisions will affect disability identity.
2. Apply principles of resonant/universal design to assistive technology.
3. Describe various assistive technologies with respect to how they impact the lived experience of disability.
4. Create the concept for a new assistive technology that addresses the needs of a real-world client.
5. Assess the success of their designed assistive technology and those of their classmates in reducing the experience of disability.
6. Value and integrate knowledge and opinions from various disciplines.
7. Work effectively with an interdisciplinary team to create a successful design for an assistive technology that addresses a real-world problem.
8. Interact respectfully and effectively with a client with a disability.
9. Critically reflect on feedback from stakeholders and clients, and integrate their thoughts, opinions and reactions into future design iterations in a meaningful manner.
10. Generate documentation that enables other individuals to reproduce and carry out the design project if they would like the same assistive technology.

Course Content/Outline

This course introduces you to the principles and praxis of designing assistive technologies for individuals with disabilities. Many assistive technologies you will work with in this course are technically less complex than systems that you will encounter in your future career as a clinican. However, the success of assistive technology design does not depend on its technical complexity, but on the designer's ability to understand and integrate it into the lived experience of an individual with a disability. This requires an understanding of the multivariate, individualistic factors that affect the acceptance of an assistive technology, combined with an understanding of the technical criteria and constraints that affect the manufacturing and production process.

At the heart of this course is a design project. Students will work in interdisciplinary teams of 3-5 to design an assistive technology in response to the request of an individual with a disability. Over the course of two semesters, students will choose a request to fulfill, research the disability involved and prior art that has addressed this problem, design an innovative solution that addresses the technical, personal and environmental needs of the situation, and respond to critical feedback given by the instructor, classmates, the individual with a disability and their caregivers. We will use case studies of traditional assistive technologies to explore issues such as stigmatization, normality, social inclusion, participation, and quality of life, all of which affect an individual's decision to accept or abandon an assistive technology. Finally, this course will cover aspects of assistive technology design that affect its successful uptake, including economics, laws and aesthetics.

Instructional methods

This course will include readings, lectures, workshops, small group work and client visits. While every effort will be made to provide students with the material required to succeed in their design projects, due to the client-driven nature of the problem descriptions, not all information that the students need can be provided in class. It is the student's responsibility to acquire this content knowledge as needed, and students are expected to develop proficiency in skills (e.g. programming languages) that are required to address the client's need. Classes will take place either in the classroom or in a workshop.

Class attendance is mandatory for this course. We will spend a significant amount of time in small group discussions and in actively analyzing and designing many different types of assistive technologies. In addition, when appropriate, individuals with disabilities will be invited to lectures, and to participate in giving you critical feedback on some of your assistive technology designs. Some class time will be devoted to giving you an opportunity to work with your teammates on your group projects, and some will be allotted to sessions where you can receive and deliver critical feedback to your classmates on their in-progress designs. In all situations, it is crucial that students are prepared for class and participate fully during class sessions.

Course material

Each class will have a designated list of readings and class notes. The class notes will be posted on myCourses immediately after each class. It is the responsibility of the student to read all assigned course materials prior to the lectures.

Student assignments and evaluation

The following assignments will be used to evaluate learning. A more detailed description of each of the assignments and evaluation methods will be posted on myCourses. Additional information will also be provided during the course of the semester. All assignments must not surpass the length determined by the instructors.

- You may complete assignments in either of the 2 official languages however alternating between French and English within an assignment is not acceptable.

Assignment	Percentages
Blog posts (two in total; 5% each)	10%
Microthemes case analysis (four in total; each 2.5%)	15%
Video assignment	10% *
Midterm presentations	20% *
Online, open-source documentation (+ high quality photos) and instructables	15% *
Logbook documentation of design process	5% *
Client evaluation	10%
Final presentation	15% *

As most of this course is based on a group project, many assignments reflect shared contributions between many group members. All assignments marked * are submitted by a group. For each group assignment, students will have the opportunity to evaluate the relative contribution of each group member, and the individual student mark will be adjusted by their individual contribution.

Public Face of the Course

The final design solutions will be available on the public website "Designing Assistive Technologies" https://dtech.moraeslab.com/, and will be combined with the solutions with past and future offerings of this course to create a public repository of assistive technology solutions.

Financing the Course

Each group will be given $500 to be spent over the course of both terms for prototyping, testing and developing the assistive technology.

Intellectual Property

This course involves the development of novel assistive technologies that may be considered inventions. The intellectual property policy at McGill University states that Student Academic Inventions (e.g. any Invention or Software that is created, conceived, developed, or first reduced to practice in the course of, or as part of, a student's coursework or extracurricular activity) belongs to the student unless the coursework or activity: (a) is a graduate student's thesis work; (b) involves activities for which the student is paid by the University; (c) involves research or coursework that is the subject of an agreement with a third party; (d) was created, conceived, developed or first reduced to practice with the creative input or invention contribution of a non-student Inventor; or (e) makes substantial use of University facilities. Since the work done in the course falls within the description of (c), (d) and (e), students are considered co-inventors, as opposed to sole-inventors, of the technology. This requires the students to consult with the course coordinator before they sell or distribute (e.g. through an App store) their invention.

The goal of this course is to develop assistive technology solutions that will be freely available to the public, and that other individuals with disabilities could use or build on their own. Thus, by default, all intellectual property resulting from this course will be available under a Creative Commons license.

Online Course Evaluations

Students are strongly encouraged to complete the online course evaluations at the end of the term. Data obtained from these evaluations are used to provide instructors with feedback as well as for identifying situations where a course or instructor needs assistance. The feedback and suggestions contained in the responses are highly valued and helpful in ensuring that instructors make appropriate changes to courses as needed in order to facilitate student learning.

Special Requirements for Course Completion and Program Continuation

Plagiarism/Academic Integrity: McGill University values academic integrity. Therefore, all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures (see http://www.mcgill.ca/students/srr/honest/ for more information).

L'université McGill attache une haute importance à l'honnêteté académique. Il incombe par conséquent à tous les étudiants de comprendre ce que l'on entend par tricherie, plagiat et autres infractions académiques, ainsi que les conséquences que peuvent avoir de telles actions, selon le Code de conduite de l'étudiant et des procédures disciplinaires (pour de plus amples renseignements, veuillez consulter le site www.mcgill.ca/students/srr/honest/).

Right to submit in English or French written work that is to be graded: In accord with McGill University's Charter of Students' Rights, students in this course have the right to submit in English or in French any written work that is to be graded, except in courses in which acquiring proficiency in a language is one of the objectives.

Conformément à la Charte des droits de l'étudiant de l'Université McGill, chaque étudiant a le droit de soumettre en français ou en anglais tout travail écrit devant être noté (sauf dans le cas des cours dont l'un des objets est la maîtrise d'une langue).

Consequences of not completing assignments as requested: Late submissions will be penalized 5% per day, including weekends.

Professional Conduct: Professionalism and accountability are expected throughout the course of the semester. This includes the on-going respectful nature of teacher-student as well as student-student interactions.

Dress Code: Professionalism with respect to dressing is encouraged throughout the course of the semester especially while on site visits.

Disability: If you have a disability please contact the instructor to arrange a time to discuss your situation. It would be helpful if you contact the Office for Students with Disabilities at (514) 398-6009 before you do this.

Technology in Class: Your respectful attentive presence is expected, therefore while you are permitted to use your laptop in class, it is understood that you will not be using your laptop or cell-phone for social purposes during class time (e.g. email, msn, sms). Your cell phone should be on silence during class time and phone calls should only take place during the break or after class.

Diversity Statement: The Occupational Therapy Program recognizes our responsibility to foster a learning environment where students and instructors can engage in dialogue and exchange ideas without being made to feel unwelcome or disrespected in view of their identity or beliefs. The Program intends that the instructional design of all courses minimize any barriers to participation, particularly barriers based on age, biological sex, disability, gender identity or expression, indigenous ancestry, linguistic and cultural background, race/ethnicity, religion, sexual orientation, political views/opinions/ideologies, and any other aspect integral to one's personhood. We therefore recognize our responsibility, both individual and collective, to strive to establish and maintain a respectful environment that is free from discrimination.

In the event of extraordinary circumstances beyond the University's control, the content and/or evaluation scheme in this course is subject to change.