

COURSE OUTLINE IDES 4310C • CAPSTONE PROJECT • Fall-Winter (2022)

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Course Time and Location: Please refer to Carleton Central under Student Services – Registration or Search Schedule: https://central.carleton.ca/prod/bwysched.p_select_term?wsea_code=EXT

Course Description

Application of design principles in a comprehensive design project. The problem area chosen should be product-oriented and of sufficient complexity. Normally undertaken in consultation with off-campus organizations and industry; supervised by faculty members.

Includes: Experiential Learning Activity.

Precludes additional credit for IDES 4300 (no longer offered).

Prerequisite(s): IDES 3302 or permission of the School of Industrial Design.

Studio and lectures six hours a week in Fall and twelve hours a week in Winter.

Learning Outcomes

By the end of this course, students will be able to:

1. Apply research methods to define a unique design problem.

2. Bridge their research to the development of an appropriate design proposal.
3. Evaluate their proposed design solution with relevant stakeholders reflective of practitioner behaviour.
4. Demonstrate a basic understanding and need for ethics to develop and evaluate appropriate designs.
5. Use appropriate methods and materials to develop and assess design solutions.
6. Produce a range of appropriate professional deliverables at each phase as reflected in the fields of design.
7. Establish a good working relationship with external partners, which includes receiving and incorporating feedback from partner groups.

Course Deliverables

These are the deliverables for this course. Please see 'Appendix A Course Description and Themes', 'Appendix B Course Schedule', and 'Appendix C Sprints' for more detailed information.

Fall Term – 35 % Final grade

Review 0: Sprint 1: First project iteration

Review 1: Sprint 2: Second project iteration - (10%)

Review 2: Sprint 3: Third project iteration - (25%)

Winter Term – 65% Final grade

Review 3: Preliminary Design – Prototype testing, usability experimentation, and user experience (15%)

Review 4: Definitive Design – Design testing (15%)

Review 5: Final Design – Design detailing, conclusions, and communication (30%)

Participation and Professionalism (5%)

Student Access to Quiz, Test and Exam Papers

Examinations are for evaluation purposes only and will not be returned to the student.

Required Materials

Materials required for the course are listed below. You may be asked by your instructor to refer to Brightspace for a more comprehensive list of required materials.

Goodwin, K. (2009). *Designing for the Digital Age: How to Create Human-Centered Products and Services*.

Guy Andr Boy. (2012). *Orchestrating Human-Centered Design*. Springer Publishing Company, Incorporated.

Kumar, V. (2012). *101 design methods*. John Wiley & Sons.

Martin, B., & Hanington, B. (2012). *Universal methods of design: 100 ways to research complex problems, develop innovative ideas, and design effective solutions*. Rockport Publishers.

Preece, J., Rogers, Y., & Sharp, H. (2019). *Interaction design: beyond human-computer interaction* (Fifth Edition.). Wiley.

Spies, Marco. (2015). *Branded Interactions: Creating the Digital Experience*

Follet, Jonathan. (2014). *Designing for Emerging Technologies: UX for Genomics, Robotics, and the Internet of Things*

Chapman & Hall (2022) *Meaningful Futures with Robots. Designing a New Coexistence*

Computer Requirements

Please refer to the computer requirements on the School of Industrial Design Website. You may be asked by your instructor to refer to Brightspace for other information or requirements related to computer work.

<http://www.id.carleton.ca/undergraduate/about-the-bid-program/computer-requirements>

Individual/Group Work

Courses may include individual and group work. It is important in collaborative work that students clearly demonstrate their individual contribution.

Review/Presentation Attendance

Attendance at scheduled SID Reviews/Presentations is mandatory. These are equivalent to exams when indicated in the course outline. Failure to attend the Review/Presentation without reasonable cause, will

result in a grade of F. Students arriving late for the Review/Presentation or not remaining for the complete session without approval from the instructor, will be addressed on a case-by-case basis at the discretion of the instructor.

If you are not able to attend a Review/Presentation, foresee arriving late or need to leave before it is complete, please email your instructor in advance explaining the reason for the situation. It is important that you provide a reasonable rationale for your absence, late arrival or early departure. In the event of an illness or death in the family, you will be required to sign a form verifying your claim and this form is available through the SID administration office.

Late Submission of Lecture & Studio Deliverables

Students who do not hand in deliverables on time will have their earned grade reduced by 10% per day up to a maximum of 3 days.

Participation and Professionalism

Active participation and professional conduct (e.g. class discussion, consultations with instructors, work ethic, etc.) are important in lecture and studio courses and may be formally evaluated by a grade.

Professionalism also includes Carleton's Policy on Academic Integrity described in more detail below with links to content which you are required to review.

Academic Integrity

Carleton's Policy on Academic Integrity is available at: <https://carleton.ca/registrar/academic-integrity/> and covers the following topics:

Plagiarism (e.g. submitting work in whole or in part by someone else, failing to acknowledge sources through the use of proper citations when using another's work).

Test and Exam Rules (e.g. attempting to read another student's exam paper, speaking to another student even if the subject matter is irrelevant to the text, using material not authorized by the examiner).

Other Violations (e.g. improper access to confidential information, disruption in classroom activities, misrepresentation of facts for any academic purpose).

This policy governs the academic behavior of students. In industrial design, ideas and concepts come from a multitude of sources and may be modified and utilized in the design and development process. The student should reference such sources appropriately and it is strongly advised that you read Carleton's Policy on Academic Integrity prior to conducting any work at the University.

Requests for Academic Accommodation

You may require special arrangements to meet your academic obligations during the term. For an accommodation request for any of the following topics below, refer to the link provided for more information: <https://students.carleton.ca/course-outline/>

- **Pregnancy obligation:** Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, please review the [Student Guide to Academic Accommodation \(PDF, 2.1 MB\)](#) For accommodation regarding a formally-scheduled final exam, you must complete the Pregnancy Accommodation Form ([click here](#)).
- **Religious/Spiritual Obligation:** Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, please review the [Student Guide to Academic Accommodation \(PDF, 2.1 MB\)](#)
- **Academic Accommodations for Students with Disabilities:** The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a documented disability requiring academic accommodations in this course, please contact the Paul Menton Centre for Students with Disabilities (PMC) at 613-520-6608 or pmc@carleton.ca for a formal evaluation or contact your PMC coordinator to send your instructor your Letter of Accommodation at the beginning of the term. You must also contact the PMC no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). After requesting accommodation from PMC, meet with your instructor as soon as possible to ensure accommodation arrangements are made. For more details, visit the [Paul Menton Centre website](#).
- **Survivors of Sexual Violence:** As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and where survivors are supported through academic accommodations as per Carleton's Sexual Violence Policy. For more information about the services available at the university and to obtain information about sexual violence and/or support, visit the [Equity and Inclusive Communities website](#).
- **Accommodations for Student Activities:** Carleton University recognizes the substantial benefits, both to the individual student and for the university, that result from a student participating in activities beyond the classroom experience. Reasonable accommodation must be provided to students who compete or perform at the national or international level. Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, see the [Senate Policy on Accommodation for Student Activities \(PDF, 25KB\)](#).

- **The Use of Self-Declaration Forms:** In place of a doctor's note or medical certificate, students may complete the [self-declaration form](#) available on the Registrar's Office website to request academic accommodation for missed course work including tests and assignments. Students are also encouraged to connect directly with their instructors to discuss required accommodations arising from the COVID-19 situation.

Statement on Student Mental Health

As a university student, you may experience a range of mental health challenges that significantly impact your academic success and overall well-being. If you need help, please speak to someone. There are numerous resources available both on- and off-campus to support you. Here is a list that may be helpful: **Emergency Resources (on and off campus):** <https://carleton.ca/health/emergencies-and-crisis/emergency-numbers/>

Carleton Resources:

- Mental Health and well-being: <https://carleton.ca/wellness/>
- Health & Counselling Services: <https://carleton.ca/health/>
- Paul Menton Centre: <https://carleton.ca/pmc/>
- Academic Advising Centre (AAC): <https://carleton.ca/academicadvising/>
- Centre for Student Academic Support (CSAS): <https://carleton.ca/csas/>
- Equity & Inclusivity Communities: <https://carleton.ca/equity/>

Off-Campus Resources:

- Distress Centre of Ottawa and Region: (613) 238-3311 or TEXT: 343-306-5550, <https://www.dcottawa.on.ca/>
- Mental Health Crisis Service: (613) 722-6914, 1-866-996-0991, <http://www.crisisline.ca/>
- Empower Me: 1-844-741-6389, <https://students.carleton.ca/services/empower-me-counselling-services/>
- Good2Talk: 1-866-925-5454, <https://good2talk.ca/>
- The Walk-In Counselling Clinic: <https://walkincounselling.com>

Statement on Pandemic Measures

It is important to remember that COVID is still present in Ottawa. The situation can change at any time and the risks of new variants and outbreaks are very real. There are [several actions you can take](#) to lower your risk and the risk you pose to those around you including being vaccinated, wearing a mask, staying home when you're sick, washing your hands and maintaining proper respiratory and cough etiquette.

Feeling sick? Remaining vigilant and not attending work or school when sick or with symptoms is critically important. If you feel ill or exhibit COVID-19 symptoms do not come to class or campus. If you feel ill or exhibit symptoms while on campus or in class, please leave campus immediately. In all situations, you should follow Carleton's [symptom-reporting protocols](#).

Masks: Masks are no longer mandatory in university buildings and facilities. However, we continue to recommend masking when indoors, particularly if physical distancing cannot be maintained. We are aware that personal preferences regarding optional mask use will vary greatly, and we ask that we all show consideration and care for each other during this transition.

Vaccines: While proof of vaccination is no longer required to access campus or participate in in-person Carleton activities, it may become necessary for the University to bring back proof of vaccination requirements on short notice if the situation and public health advice changes. Students are strongly encouraged to get a full course of vaccination, including booster doses as soon as they are eligible and submit their booster dose information in [cuScreen](#) as soon as possible. Please note that Carleton cannot guarantee that it will be able to offer virtual or hybrid learning options for those who are unable to attend the campus.

All members of the Carleton community are required to follow requirements and guidelines regarding health and safety which may change from time to time. For the most recent information about Carleton's COVID-19 response and health and safety requirements please see the [University's COVID-19 website](#) and review the [Frequently Asked Questions \(FAQs\)](#). Should you have additional questions after reviewing, please contact covidinfo@carleton.ca.

Student Responsibility

The student is responsible for knowing the content of this course outline; the schedule of classes, assignments, and/or Reviews; and the material that was covered when absent. The studio is a professional environment and students should be working during the scheduled hours.

Unless otherwise arranged, the class will meet during scheduled class hours. Please note that attendance is important since issues and questions may be raised in class, and announcements made, along with information disseminated through Brightspace. As external professionals are often involved in our work, scheduling changes for guest lectures, presentations, and Reviews may occur at short notice, requiring students to stay informed.

Changes to the Course Outline

The course outline may be subject to change in the event of extenuating circumstances.

Appendix A - Course Description and Themes

IDES 4310C CAPSTONE PROJECT F22

Course Description

The Capstone project puts into practice what the students have learned over the last 4 years in the School of Industrial Design in a project that addresses a real context situation with significant complexity. The project follows an incremental, multi-phased approach with several iterative actions culminating in a series of deliverables. Students propose their own solutions considering the aspects of design research, human-centred design, innovation, critical analysis, human factors, theoretical references, prototyping, technology, visual communication, historical, cultural, and aesthetic contexts. This final design is derived from a structured, yet not straight process, involving multidisciplinary knowledge from different sources.

Phases

The project utilizes Scrum/Cooking Pressure and Waterfall design frameworks as design development processes (see Appendix B).

Fall

In Scrum, a method widely used in UX and other related design disciplines, the solution is built in a series of iterations called sprints. Each sprint comprises the same design actions (see Appendix C) allowing the designer to iterate, and therefore, change and improve over time the entire design process from “problem definition” to “testing”. This iterative approach helps overcome many of the recurring problems people often experience in more traditional frameworks. The Scrum process implements a “cooking pressure” dynamic, providing more time to develop the entire project in the following iteration.

Winter

The Waterfall framework, a more sequential development, is focused on the solution where design aspects such as usability, aesthetics, structure, and functionality are tested and fine-tuned. Building and testing prototypes are more intensive in this second phase. The final section of this phase is dedicated to preparing a communication strategy of both the process and the final solution in a variety of mediums. By the end of this phase, students are ready to present their work at the Grad Show.

Themes

Designing user experiences with social robots

Four DRobotics Corporation

Robots are more ubiquitous now than ever and we interact with them on daily basis. They are no longer relegated to an assembly line, on the contrary, we could engage with them at grocery stores, malls, or homes. Robots are now more perceptive (via more sensors), make smart decisions (via onboard decision-making processes), and are more independent than ever (using integrated motors). While these features are increasing, there is a growing interest in exploring how we interact with these robots when they are part of our daily life. Robots were imagined and developed as a replacement for humans but are now seen as positive add-ons or assistive.

One of the emerging categories is “assistive social robots”, from hospitality, service, or companion solutions. This category possesses a stronger human-robot interaction than “fixed industry robots” which are more focused on accuracy, repetition, and performance. Therefore, it is becoming increasingly important to ensure valuable human experiences with these solutions. The challenge lies in placing the end-user at the heart of the design process, understanding the problem space, user’s needs, desires, and intents so that we can design robot solutions that provide value to these users.

In collaboration with Four Drobotics, a world leader in customized autonomous vehicles for physical security, surveillance, and space applications, students will explore innovative design solutions, experiences and/or services that will support the interaction between users and security patrol robots that take place in daily life scenarios, such as university campus, neighbourhoods, malls, homes, etc.

Designing for responsible purchasing

Shopify, Retail Hardware

COVID-19 impacted the way how retailers and buyers experience shopping. One of the most visible changes was the big shift from in-person interaction to digital engagement. This in turn improved online shopping efficiency with increased e-commerce sales. However, underneath this, there are new attitudes and habits that are changing what we value, how and where we shop, and how we live and work as a community. This latent behaviour led buyers to respond to the crisis with a more conscious-mindful approach, buying local, and investing more time in buying more sustainable products while embracing digital e-commerce. Consequently, this led merchants to build brands with a stronger social responsibility approach.

In the journey for retailers to look for new ways to connect with their customers and enhance the shopping experience, we could bring them together based on experiential values and responsible consumption. How can we enhance buyers' experiences when they buy something? How can we support retailers to provide fewer transient transactions whether they take place in-store or online?

With Shopify, the world leader eCommerce platform for all businesses, students will engage with an interesting project, exploring potential opportunities to improve merchants-buyers experiences toward better consumption behaviours, designing physical in-person commerce and in-store experiences that support new shopping interactions.

Designing strategies for reducing eCommerce returns

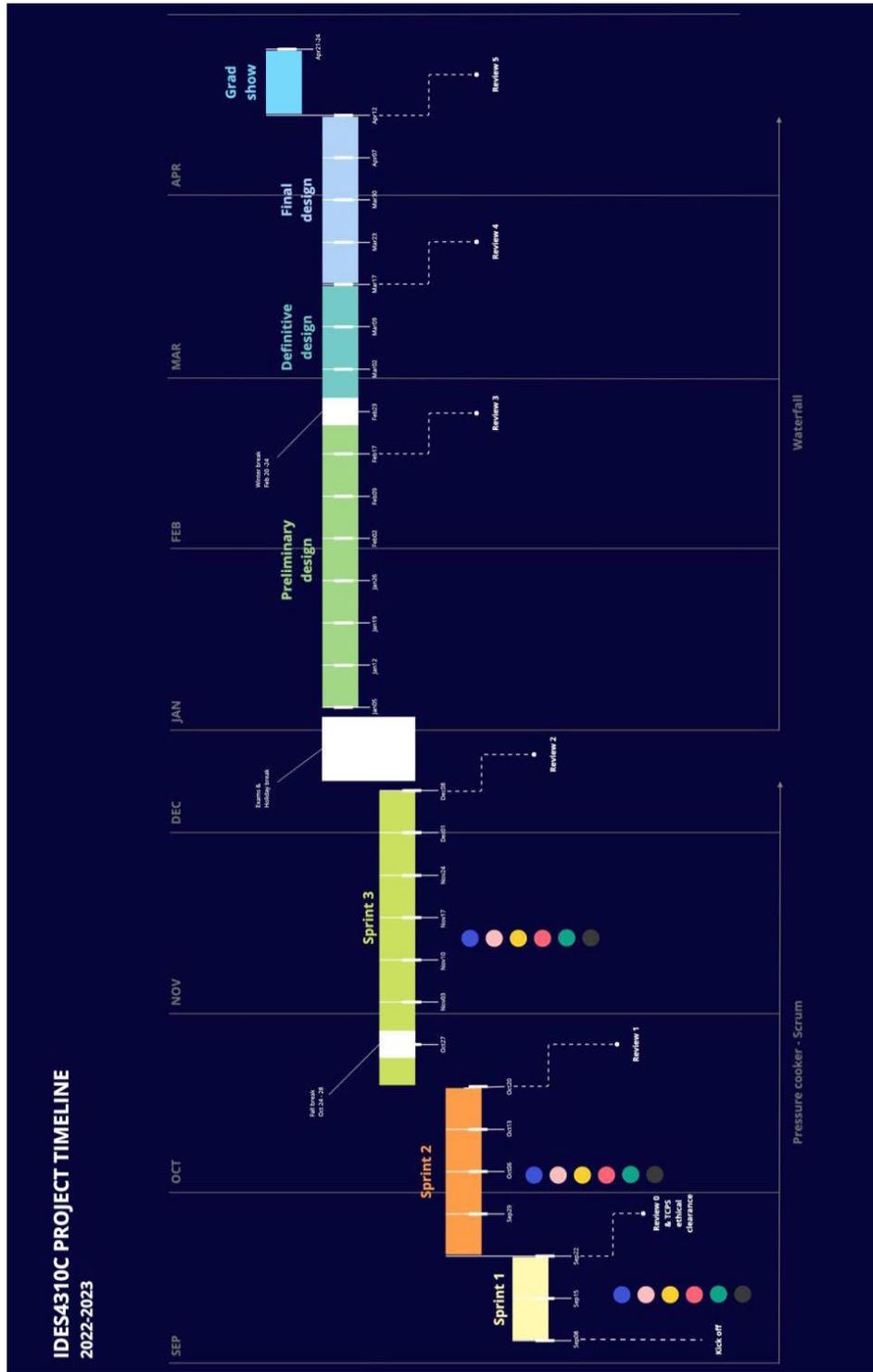
Shopify, post-fulfillment workflows

Online shopping rose strongly during the pandemic, but this trend increased the number of items being sent back to stores or warehouses. Retailing returns jumped to an average of 16.6% in 2021 versus 10.6% in 2020. Online shopping makes it easy to select and buy items, but hard to visualize in person how they look, feel, fit, sound, or simply because they are not as expected. Ecommerce returns happen across all industries and apparel retailing alone is taking a large portion. For retailers, this affects profit margins deciding whether they can resell or take the loss. For customers, this affects their positive perception of a brand or even their loyalty. Basically, this is a headache for both parties.

In the past, retailers overlooked what happened after the sale. Now, they are looking for innovative strategies to deal with this dilemma, from adding workers, improving logistics, or increasing warehouse space. However, studying the customer experience could support better eCommerce processes before and after purchase to ultimately reduce online returns. How can we support retailers and customers towards better online experiences with the goal of reducing the return rate?

In collaboration with Shopify, the world leader eCommerce platform, students will have the opportunity to explore, define, and design a better customer experience that helps both retailers and customers to manage and reduce unwanted purchases coming back to retailers' stores.

Appendix B - Course structure



Appendix C - Sprints

