CARLETON UNIVERSITY
# SCHOOL OF INDUSTRIAL DESIGN

**COURSE OUTLINE IDES 3305B • SPECIAL STUDIES • Winter (2025)**

**Instructor:** **Juan Jimenez Garcia**

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Location: 2496 ME

Office Hours: **Available upon request**

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## Course Time and Location:

Course locations are no longer displayed on the public class schedule and are subject to change. For the latest information please refer to Carleton Central under Student Services – Registration – Student Timetable.

## Course Description

Special Industrial Design Studies deal with specific projects, which may differ from year to year depending on the availability of specialists in a particular field or study opportunities as they present themselves. For details, see Appendix A.

Prerequisite(s): IDES 2302 and Third or Fourth Year standing or permission of the School of Industrial Design.

Lectures, tutorials, laboratory and studio three hours a week or equivalent.

## Learning Outcomes

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

1. **Critical Evaluation of Data Use**: Encouraging students to assess the ethical, social, and practical implications of data in daily life and healthcare.

2. **Application of Data-Driven Design Principles**: Guiding students to create user-centred solutions through informed design practices.

3. **Crafting and Presenting Data Effectively:** Developing skills to manipulate and present data in ways that create meaningful impact.

4. **Exploration of Innovative Data Methods**: Inspiring students to discover new ways to process and deliver data, enhancing user engagement and understanding.

This approach ensures that, through each assignment, students not only delve deeper into a particular objective but also reinforce their knowledge and skills across all areas, highlighting the interconnectedness of the course content.

## Course Deliverables

These are the deliverables for this course. Please see 'Appendix B Course Schedule' for more detailed information.

**Assignment 1: Exploring National or Global Data – Deliverable due to February 3, 2024**

Overview: Students will use an existing dataset (e.g., Canadian statistics, UN data, or others) to explore straightforward data physicalization. This assignment focuses on foundational skills, including data analysis, scope definition, and physical representation.

Objectives:

- Introduce students to key principles of data physicalization.
- Develop an understanding of how to translate abstract datasets into tangible artifacts.
- Familiarize students with iterative prototyping processes.

**Assignment 2: Contrasting Behaviors with Comparative Data – Deliverable due to March 3, 2024**

Overview: Students will work with datasets that compare two human behaviours, such as daily routines (a potential source is the “yes-no” illustrations of contradictions). This assignment emphasizes comparative data as a design challenge.

Objectives:

- Explore how to visually and physically represent contrasting data.
- Encourage innovative thinking by using contrasting narratives to create impactful designs.

**Assignment 3: Reflecting on Kindness and Gratitude – Deliverable due to March 31, 2024**

Overview: Students will collect personal data on kindness and gratitude over several weeks, using diaries as a dataset. This assignment focuses on emotional engagement and self-reflection.

Objectives:

- Translate personal, qualitative data into reflective physicalizations.
- Create artifacts that provoke thought and emotional resonance.

## 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.

Important Clarification:

This list outlines the required materials for reference purposes only. Students are not required to purchase new items if they already have suitable materials. Price ranges are provided in case purchases are necessary.

Reminder:

Students are encouraged to reuse or share materials whenever possible. The following list provides an overview of required items with approximate costs to assist in planning and budgeting. *Please note that each project will have unique material, cost, and manufacturing requirements. As such, the estimated costs presented here are projections and not fixed amounts.*

**Assignment 1: Materials and Costs (Per Group of ~4 Students)**

Materials List:

1. Cardboard Sheets:
   - Types: Corrugated cardboard, presentation board.
   - Sizes: 24 in x 36 in sheets or larger.
   - Price Range: $2 to $10 per sheet (depending on thickness and quality).
2. Foam Boards:
   - Sizes: 20 in x 30 in sheets, 3/16 inch thickness (standard).
   - Price Range: $5 to $15 per sheet.
3. Basic Craft Supplies:
   - Glue: White glue, hot glue sticks.
     - Price Range: $2 to $10 per bottle/pack.
   - Tape: Masking tape, clear tape, double-sided tape.
     - Price Range: $3 to $8 per roll.
   - Markers: Assorted colours (washable or permanent).
     - Price Range: $5 to $15 per set.
4. Optional Access to Laser Cutters or 3D Printers:
   - Laser Cutter Costs: Varies depending on lab or university facility access.
   - 3D Printing Costs: ~$5 to $50, depending on material volume and filament type.

**Assignment 2: Materials and Costs (Per Group of ~4 Students)**

Materials List:

1. LEGO Kits: (mostly provided)
   - Types: LEGO Classic or Technic sets.

- Price Range: $25 to $100 per kit, depending on complexity and size.

2. Wood or Foam for Modular Builds:
   - Wood Pieces: Small blocks, dowels, or plywood sheets.
     - Price Range: $10 to $30 (per group for basic materials).
   - Foam Sheets/Blocks: Craft foam or styrofoam sheets.
     - Price Range: $5 to $20 per sheet/block.
3. Craft Supplies:
   - Paints: Acrylic or water-based.
     - Price Range: $5 to $20 per set.
   - Adhesives: Hot glue, wood glue.
     - Price Range: $3 to $10 per bottle/pack.
4. Optional Access to Laser Cutters or 3D Printers:
   - Laser Cutting Costs: As per facility access.
   - 3D Printing Costs: ~$5 to $50 (based on material usage).

**Assignment 3: Materials and Costs (Per Group of ~4 Students)**

Materials List:

1. Fabrics and Yarn for Tactile Qualities:
   - Types: Felt, cotton, polyester, yarn (variety of colours and textures).
   - Price Range: $5 to $30 (depending on material and quantity).
2. Foam or Clay for Sculptural Elements:
   - Foam Sheets/Blocks: Craft foam or modelling foam.
     - Price Range: $5 to $20 per sheet/block.
   - Clay: Air-dry clay, polymer clay (e.g., Sculpey).
     - Price Range: $10 to $25 per pack (500g to 1kg).
3. 3D Representations (Renders):
   - Software: Free access to programs like Blender, Rhino, or SketchUp.
   - Cost: Typically $0 (free software options available).
4. Small Electronics for Interactivity (Optional):

- Examples: LEDs, batteries, simple circuits (e.g., Arduino).
- Price Range: $10 to $50 (depending on complexity).

**Estimated Costs Per Assignment:**

- Assignment 1: $20 to $80 per group.
- Assignment 2: $50 to $150 per group.
- Assignment 3: $30 to $100 per group.

## Technology Requirements

Please refer to the technology 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 coursework.

https://carleton.ca/id/student-info/computer-it-support/computer-requirements/

## Individual/Group Work

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

## 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 instructor's discretion.

If you are unable 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.

## Late Submission of Assignments

Students who do not hand in assignments on time will have their earned grade reduced by 10% per day at the instructor's discretion. If you foresee not meeting the submission due date and are requesting an extension, please provide your instructor with a minimum of 24 hours' notice.

## 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 that you are required to review.

## Health and Safety

Students must participate in training to access all the SID Labs and Maker Space. Apart from this training, students are required to follow the health and safety standards of the School of Industrial Design as well as Carleton's health and safety standards. All materials related to SID health and safety are available here Health and Safety and it is expected that students review and understand these materials and apply these standards throughout their studies.

## Use of Studio Spaces

Access to studio space to attend courses and complete assignments is an important part of student success. To support access, specific studios have been designated to certain years and/or sections.

1st Year Studio Section A – Studio A
1st Year Studio Section B – Studio B
2nd Year Studio Section A – Studio A
2nd Year Studio Section B – Studio B
3rd Year Studio Section A & B – Studio C
4th Year Studio All Sections (Capstone and Minor) – Studio D
MDes Studio – MDes Studio

Students are welcome and encouraged to use their designated spaces to work during non-studio hours. Out of respect for your colleagues, instructors, and Carleton cleaning staff, ensure you leave the space in

good condition. This includes cleaning your area and storing your items in your designated storage space. The School will not be responsible for items that are not stored properly.

## Academic Integrity

Carleton's Policy on Academic Integrity is available at: https://carleton.ca/registrar/academic-integrity/ and covers the following violations, but is not limited to:

- *Plagiarism*
    - *Submitting work written 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*
    - *Attempting to read another student's exam paper*
    - *Speaking to another student (even if the subject matter is irrelevant to text)*
    - *Using material not authorized by the examiner*
- *Other Violations*
    - *Improper access to confidential information such as exams or test questions*
    - *Disruption of classroom activities or periods of instruction*
    - *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 before conducting any work at the University.

### Use of Artificial Intelligence (AI) Technologies

To effectively address the incorporation of AI technologies, specifically generative AI tools, into courses, we have instituted the following guidelines. Further information can be found here - https://carleton.ca/tls/teachingresources/generative-artificial-intelligence/recommendations-and-guidelines/. Another useful resource is the Library's guide on AI tools - https://library.carleton.ca/guides/subject/artificial-intelligence-ai-tools.

1. Academic Integrity Standards: In the absence of explicit permission from the instructor within a given course, the use of generative AI tools to create content, (e.g., text, code, images, summaries, videos, etc.), is deemed a breach of academic integrity standards.

2. Instructor's Discretion: Instructors have the authority to grant permission for the use of generative AI tools, (e.g., ChatGPT and similar tools), based on alignment with the course's educational objectives and learning outcomes. Assignment and examination guidelines will be written to explicitly reflect this granted permission.

3. Clear Instructions: Should instructors choose to permit the use of generative AI tools, an assessment guideline will provide students with clear and detailed direction, including;

    i. Identification of specific generative AI tools that are acceptable for use.
    ii. Clarity on the approved applications of these tools.

These measures aim to create a balanced and transparent educational environment, ensuring both academic integrity and the responsible integration of AI technologies into the learning experience.

## 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 below topics, refer to this link - https://students.carleton.ca/course-outline/ and open the needed section.

**Topics:**

- *Pregnancy Obligations*
- *Religious/Spiritual Obligation*
- *Academic Accommodations for Students with Disabilities*
- *Survivors of Sexual Violence*
- *Accommodations for Student Activities*
- *Academic Considerations for Medical and Other Extenuating Circumstances*
- *Scheduling and Examination Support*

## 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, refer to this link - https://wellness.carleton.ca/ and open the needed section.

**Topics:**

- *Counselling*
- *Resource Guide*
    - *Thriving on Campus*
    - *Everyday Stress*
    - *Mild Mental Health Concerns*
    - *Moderate Mental Health Concerns*
    - *Complex Mental Health Concerns*
- *Umbrella Project*

## 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, or valuable information may be shared, all of which can greatly benefit the student's learning experience. As external professionals may be 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.

## Annexe A – Course Description

**IDES 3305B SPECIAL STUDIES W25 - Juan Jimenez Garcia - Course Schedule**.

**“Data Physicalization: Crafting Tangible Reflections in a Data-Driven World”**

### 1. Course Description

In a world saturated with data, designers must rethink how information is tailored, communicated, and reflected upon to support users effectively. This course delves into the emerging field of data physicalization, exploring how designers can craft data into physical representations that foster meaningful interactions, understanding, and self-reflection. While technological systems and personal informatics tools excel at quantifying and displaying data, they often fail to account for their psychological impact, leaving users overwhelmed and disconnected (Van Dijk et al., 2015; Mols et al., 2016).

Data physicalization offers a promising alternative, enabling designers to transform abstract, quantitative measures into tangible artifacts that engage users, encourage reflection, and support behaviour change (Jansen et al., 2015; Niess & Woźniak, 2018). By bridging the gap between qualitative goals (e.g., well-being or satisfaction) and quantitative tracking, this course empowers students to create innovative data representations that foster personal understanding and informed decision-making. Through hands-on assignments, students will learn how to design data physicalizations that not only communicate information effectively but also create space for deeper engagement and reflection.

### 2. Goal

To train students to design and build data physicalizations that enhance users’ ability to reflect on and interact with data meaningfully, focusing on crafting designs that balance information delivery with psychological engagement.

### 3. Approach

Students will use datasets related to real-world problems and personal informatics, focusing on how data representations can foster self-reflection and behavioral change. The course combines theoretical insights with hands-on prototyping, encouraging students to explore how data is collected, quantified, and transformed into physical, reflective artifacts.

Potential datasets include:

- Mental health and well-being metrics (e.g., stress levels, happiness indices).
- Environmental sustainability data (e.g., energy consumption, recycling habits).
- Physical activity and health tracking (e.g., step counts, heart rates).
- Community and social dynamics (e.g., survey responses, public opinions).

## Annexe B - Course Schedule

| Week / Date | Focus / Activities | Content |
|---|---|---|
| ***Class 1*** Jan. 6h | Session 1 - Intro & Assignment 1 Kickoff | Course overview, introduction to data physicalization, and Assignment 1 kickoff (group work). |
| ***Class 2*** Jan. 13th | Session 2 - Lecture 1 | Lecture 1: Introduction to Data Physicalization - Definition, origins, goals, barriers, opportunities. |
| ***Class 3*** Jan. 20rd | Session 3 - Ideation and Design | Ideation and concept development for Assignment 1 (groups work on sketches and mock-ups). |
| ***Class 4*** Jan. 27st | Session 4 - Project 1 Presentations | Assignment 1 presentations and group exhibitions (final prototypes shared and discussed). |
| ***Class 5*** Feb. 03th | Session 5 - Lecture 2 & Assignment 2 Kickoff | Lecture 2: Personal Informatics and Users' Reflection and Assignment 2 kickoff (group work). |
| ***Class 6*** Feb. 10th | Session 6 - Ideation and Design | Ideation and design for Assignment 2 (focusing on comparative data concepts). |
| Feb. 17th-21rd | *WINTER BREAK* | |
| ***Class 7*** Feb. 24th | Session 7 - Project 2 Presentations | Assignment 2 presentations and group exhibitions (final comparative prototypes presented). |
| ***Class 8*** Mar. 3th | Session 8 - Lecture 3 & Assignment 3 Kickoff | Lecture 3: Data Physicalization Qualities and Attributes and Assignment 3 kickoff (group work). |

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|---|---|---|
| ***Class 9***<br>Mar. 10th | Session 9 - Lecture 4 | Lecture 4: Data Physicalization Determinants and Evaluation - Creating and assessing prototypes. |
| ***Class 10***<br>Mar. 17th | Session 10 - Ideation and Design | Ideation and design development for Assignment 3 (personal data on kindness and gratitude). |
| ***Class 11***<br>Mar. 24th | Session 11 - Design | Final design refinement and preparation for Assignment 3 presentations. |
| ***Class 12***<br>Mar. 31st | Session 12 - Final Presentations | Assignment 3 final presentations |
| ***Class 13***<br>Apr. 07th | Course Wrap-Up and Exhibition | Exhibitions (personal data physicalizations). |

**Assignment Kickoff Dates:**

- Assignment 1 (Group Project): January 6, 2024.
- Assignment 2 (Group Project): February 3, 2024.
- Assignment 3 (Group Project): March 3, 2024.

**Assignments in Groups:**

All assignments will be completed in groups of approximately 4 students, promoting collaboration, discussion, and shared responsibility.

**Project Exhibitions:**

Each assignment concludes with group presentations and exhibitions, where students share their prototypes, discuss the design process, and receive peer and instructor feedback.