

ARCH 510 - CODING DESIGN

FALL 2020

Instructor: Maya Przybylski // mmprzyby@uwaterloo.ca

Class Meeting Time

Wednesdays: 2:00pm – 5:00pm
MS TEAMS

Course Support

Maya's Przybylski
Office hours (by appointment)
Wednesdays: 12:30-1:30pm
MS-TEAMS

Coding Help
Silia Walenius
TBC
MS-TEAMS

Coding Help
Andre Gignac
TBC
MS-TEAMS

TERRITORIAL ACKNOWLEDGEMENT

We acknowledge that the School of Architecture is located on the traditional territory of The Neutral, Anishinaabeg and Haudenosaunee peoples. The University is situated on the Haldimand Tract, the land promised to the Six Nations that includes 10 kilometres on each side of the Grand River. (see references here: <https://uwaterloo.ca/engineering/about/territorial-acknowledgement>)

SPECIAL STATEMENT FOR FALL 2020

During times of remote learning due to the COVID-19 pandemic, I want to reassure all of you that I am aware of the types of challenges you are facing and will work with you to support your learning to the best of my ability. Please feel free to get in touch about any issues or supports that you may need in addition to the ones outlined in this document. We're in this together.

COURSE DESCRIPTION

“Computer Science is no more about computers than astronomy is about telescopes”

Edsger Dijkstra (1930-2002), a Turing Award (1972) winning computer scientist known for his contributions to the development of programming languages, graph theory and distributed computing.

For many designers, the computer is just an advanced tool that enables, through the use of out-of-the-box software, the digitization of that which is predetermined and well-defined. In contrast to this view, characterized as computerization, an emerging expanded view of the role of the computer deals directly with computation – using the underlying principles of the computer’s rule-based intelligence in order to determine formal and organizational strategies.

Coding Design posits that through working in the process-oriented methods associated with programming, new ways of design thinking are exposed. The course positions computers and their associated technologies not only as machines used in the imitation and appropriation of what is already understood but also as vehicles for exploring and visualizing what is yet to be discovered.

This course offers an introduction to the fundamentals of computer programming through media computation for design students. We will work in the Java-based Processing programming environment.

COURSE GOALS & LEARNING OUTCOMES

Upon completion of this course, students should be able to:

Conceive, design and implement interactive graphical programs

See code as a material and tool to expand their design practice

Engage with the computational design discourse

COURSE STRUCTURE

The primary format for learning takes place in the form of Live Lectures and Open Lab sessions. During Live Lectures the instructor will walk through specific topics and issues after which students will engage in the lesson directly through working on various in-class exercises in the open lab sessions.

The goal for these working sessions is to allow for the students to become fully immersed in the conceptual frameworks and technical realities of working within a computational discourse. These sessions will move through basic coding components and culminate in the students' ability to develop custom algorithms for driving production of visual artifacts. The course covers: fundamental language concepts such as variables, conditionals, loops, functions, and arrays, programming concepts such as coding style, modular design, testing, and debugging and media concepts such as 2D graphics drawing, input, animation, and image processing. A complete breakdown of topics is presented in the course schedule on page 3.

COURSE REQUIREMENTS & EVALUATION:

The course grade will be based on eight (8) lab assignments, and a course project. The breakdown is as follows:

Lab Exercises:	30% (each lab accounting for 3.75% of final grade)
Course Project:	70%

LAB EXERCISES

Lab exercises will be assigned at the end of the first nine class sessions. Each exercise will be due (via electronic submission) prior to the following week's class. While nine lab exercises will be issued students are required to submit only eight exercises. Lab exercises will be graded on a pass-fail basis where a completed lab will contribute 3.75% to your final grade and a missing lab will contribute 0%. (3.75% x 8 = 30%).

COURSE PROJECT

Students are encouraged to work in pairs on the course project. Each project team will be responsible for conceiving and developing their own Processing project. Ideally students are able to isolate aspects of their ongoing thesis work/studio work that could be explored within a computational/processing environment. A hand-out describing the project requirements, timelines and evaluation criteria will be distributed early in the term.

TOPICS & SCHEDULE

This list represents an exhaustive list of topics. The schedule of topics will be adjusted to respond to the pace of the learning as required.

W1	September 9	School-wide Vertical Project - No Class	
W2	September 16	2:00-4:30PM	Live Lecture 1 - Intro/ Algorithms / Processing / Draw
		4:30-5:00PM	Open Lab
W3	September 23	2PM	Lab 1 Due
		2-4:00PM	Live Lecture 2 - Colour / Variables / Flow
		4-5:00PM	Open Lab
W4	September 30	2PM	Lab 2 Due
		2-4:00PM	Live Lecture 3 - Repeat / Calculate / Random / Interactivity
		4-5:00PM	Open Lab - <i>Wave Clock walk-through</i>
W5	October 7	2PM	Lab 3 Due
		2PM	Project Part 1 (Proposal) Due @ 2PM
		2-4:00PM	Live Lecture 4 - Interactivity / Functions / Objects
		4-5:00PM	Open Lab - <i>Emergent Bubbles walk-through</i>
W6	October 14	Reading Week - No class	
W7	October 21	2PM	Lab 4 Due
		2-4:00PM	Live Lecture 5 - Arrays / Algorithms / Debugging / Libraries
		4-5:00PM	Open Lab - <i>Raindrop Catcher walk-through</i>
W8	October 28	2 PM	Lab 5 Due
		2-4:00PM	Live Lecture 6 - Text / Typography / Image / Transformations
		4-5:00PM	Open Lab
W9	November 4	2 PM	Lab 6 Due
		2-4:00PM	Live Lecture 7 - Motion / Time
		4-5:00PM	Open Lab
W10	November 11	2 PM	Project Part 2 (Schematic Design) Due @ 2PM
		2 PM	Lab 7 Due
		2-4:00PM	Live Lecture 8 - Data / Interface
		4-5:00PM	Open Lab - <i>Data-Driven walk-through</i>
W11	November 18		Lab 8 Due
			Live Lecture 9 - Vertices / 3D Drawing / Shapes
		4-5:00PM	Open Lab -
W12	November 25		Lab 9 Due
			Live Lecture 10 - Dynamic Drawing / Simulation
			Open Lab - <i>The Game of Life walk-through</i>
W13	December 2	2-5:00PM	Open Lab -
-	December 17		Project Parts 3&4 (Code Development & Report) Due @ 10PM

TECHNOLOGICAL PLATFORMS + ACCESS

While there are numerous platforms suitable for the introduction of such techniques, we will be primarily working in a suite of tools built around Processing -- a programming language, development environment, and online community that since 2001 has promoted software literacy within the visual arts. Initially created to serve as a software sketchbook and to teach fundamentals of computer programming within a visual context, Processing quickly developed into a tool for creating finished professional work as well.

It is expected that students have a computer loaded with the Processing development tools available during each session.

Processing is available for free from the project's website (<http://processing.org>)

REQUIRED TEXTBOOK

Students should own or have ready access to the following text:

Reas, Casey. Fry, Ben. *Processing : A Programming Handbook for Visual Designers and Artists, Second Edition*. Cambridge Massachusetts; London England : MIT Press, 2014. Online version of this text is available through UW Library: https://ocul-wtl.primo.exlibrisgroup.com/permalink/01OCUL_WTL/156lh75/cdi_skillsoft_books24x7_bkv000073658

Related site for all things processing: <https://processing.org/>

ADDITIONAL BOOKS & ONLINE RESOURCES

Shiffman, Daniel. *The Nature of Code: Simulating Natural Systems with Processing*. Daniel Shiffman. 2012. This book focuses on the programming strategies and techniques behind computer simulations of natural systems. Available for free: <https://natureofcode.com>

Gross, Benedikt. Hartmut Bohnacker, Julia Laub, Claudius Lazzeroni. *Generative Design: Visualize, Program, & Create with JavaScript in p5.js*. Princeton Architectural Press. 2018. Nice reference for projects but also a good way to get started in p5.js.

Pearson, Matt. *Generative Art: A practical guide using Processing*. Manning, 2011. This book offers a handful of more complex generative drawing examples. We will walk through some of them in the course. Online version of this text is available through UW Library: https://ocul-wtl.primo.exlibrisgroup.com/permalink/01OCUL_WTL/5ob3ju/alma999986580959905162

<https://www.creativeapplications.net/category/processing/> Nice collection of creative projects developed in Processing.

<https://p5js.org/> For embedding processing in web-pages.

OFFICIAL BUSINESS

REMOTE COURSE DELIVERY PLATFORMS & COMMUNICATION

We will be using additional platforms to deliver, organize and share course content, learning and work during remote learning. Here is a breakdown of tools we will use in this course:

MS TEAMS – Virtual Hub for the course. Used for organizing course documents, activities and discussions as well as conducting course lectures and meetings. Students will be added to the course team in the first week of class.

LEARN – Official communication, work submission, and grade recording and release.

Microsoft Whiteboard - While MS Teams supports whiteboard sharing - The stand-alone MS Whiteboard app improves functionality and is recommended but not required.

COURSE TIME ZONE

All dates and times communicated in the document are expressed in Eastern Time (Local time in Waterloo Ontario, Canada). From September 8 – October 24 2020 times are indicated in Eastern Daylight Time (EDT, UTC—4:00) and from October 25 – December 31 2020, times are indicated in Eastern Standard Time (EST, UTC—5:00)

FALL 2020 COVID-19 SPECIAL STATEMENT

Given the continuously evolving situation around COVID-19, students are to refer to the University of Waterloo's developing information resource page (<https://uwaterloo.ca/coronavirus/>) for up-to-date information on academic updates, health services, important dates, co-op, accommodation rules and other university level responses to COVID-19.

STUDENT NOTICE OF RECORDING

The course's official Notice of Recording document is found on the course's LEARN site. This document outlines shared responsibilities for instructors and students around issues of privacy and security. Each student is responsible for reviewing this document.

All Live Lectures and Open Labs - including questions and answers - will be recorded and made available through official course platforms (LEARN and/or MS Teams). Students wishing not to be captured in the recordings have the option of participating through the direct chat or question and answer functions in the meeting platforms used.

Meetings taking place between students and the course team outside of class time will not be recorded.

EVALUATION GUIDELINES

The following is offered as a guide to numerical grade assignments:

>=90	Consistent exemplary work that exceeds expectations. Work is holistically thought provoking and executed at a very high level.
85-89	Some elements of work are exceeding expectations and executed at a high level but this level of achievement is not maintained throughout all project elements
80-84	Work is consistently above average and student is actively participating and actively engaging the course material
77-79	Average work. Student is completing work in a timely manner and participating in the course. No attendance issues. Shows expected levels of competency in course materials.
70-76	Work is complete and meets expectations on some points while operates below expectations on others
50-69	Work is incomplete or completed with minimal comprehension and effort.
< 50	Work is unacceptable and does not fulfill the requirements.

LATE WORK

Assignments that are handed in late will receive an initial penalty of 5% on the first calendar day late and a 5% penalty per calendar day thereafter. After 5 calendar days, the assignment will receive a 0%.

Only in the case of a justified medical or personal reason will these penalties be waived, and only if these have been officially submitted to the Undergraduate Student Services Co-Ordinator (Donna Woolcott) and accepted by the Undergraduate Office.

Students seeking accommodations due to COVID-19, are to follow Covid-19-related accommodations as outlined by the university here: (<https://uwaterloo.ca/coronavirus/academic-information#accommodations>).

MENTAL HEALTH SUPPORT

All of us need a support system. We encourage you to seek out mental health supports when they are needed. Please reach out to Campus Wellness (<https://uwaterloo.ca/campus-wellness/>) and Counselling Services (<https://uwaterloo.ca/campus-wellness/counselling-services>).

We understand that these circumstances can be troubling, and you may need to speak with someone for emotional support. Good2Talk (<https://good2talk.ca/>) is a post-secondary student helpline based in Ontario, Canada that is available to all students.

EQUITY, DIVERSITY AND INCLUSION COMMITMENT

At the School of Architecture, we are committed to foster and support equity, diversity and inclusion. We recognize however, that discrimination does occur, sometimes through an isolated act, but also through practices and policies that must be changed. If you experience discrimination, micro-aggression, or other forms of racism, sexism, discrimination against LGBTQ2S+, or disability, there are different pathways to report them:

A) If you feel comfortable bringing this up directly with the faculty, staff or student who has said or done something offensive, we invite you, or a friend, to speak directly with this person. People make mistakes and dealing them directly in the present may be the most effective means of addressing the issue.

B) you can reach out to either the undergraduate ([Donna Woolcott](#) or [Maya Przybylski](#)), graduate office ([Nicole Guenther](#), [Lola Sheppard](#), or [Jane Hutton](#)), or director ([Anne Bordeleau](#)). If you contact any of these people in confidence, they are bound to preserve your anonymity and follow up on your report.

C) You may also choose to report centrally to the Equity Office. The Equity Office can be reached by emailing equity@uwaterloo.ca. More information on the functions and services of the equity office can be found here: <https://uwaterloo.ca/human-rights-equity-inclusion/about/equity-office>.

ACADEMIC INTEGRITY, GRIEVANCE, DISCIPLINE, APPEALS AND NOTE FOR STUDENTS WITH DISABILITIES:

Academic integrity: In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility. [Check the Office of Academic Integrity for more information.]

Grievance: A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read Policy 70, Student Petitions and Grievances, Section 4. When in doubt, please be certain to contact the department's administrative assistant who will provide further assistance.

Discipline: A student is expected to know what constitutes academic integrity to avoid committing an academic offence, and to take responsibility for his/her actions. [Check the Office of Academic Integrity for more information.] A student who is unsure whether an action constitutes an offence, or who needs help in learning how to avoid offences (e.g., plagiarism, cheating) or about "rules" for group work/collaboration should seek guidance from the course instructor, academic advisor, or the undergraduate associate dean. For information on categories of offences and types of penalties, students should refer to Policy 71, Student Discipline. For typical penalties, check Guidelines for the Assessment of Penalties.

Appeals: A decision made or penalty imposed under Policy 70, Student Petitions and Grievances (other than a petition) or Policy 71, Student Discipline may be appealed if there is a ground. A student who believes he/she has a ground for an appeal should refer to Policy 72, Student Appeals.

Note for students with disabilities: AccessAbility Services, located in Needles Hall, Room 1401, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with AccessAbility Services at the beginning of each academic term.

Turnitin.com: Text matching software (Turnitin®) may be used to screen assignments in this course. Turnitin® is used to verify that all materials and sources in assignments are documented. Students' submissions are stored on a U.S. server, therefore students must be given an alternative (e.g., scaffolded assignment or annotated bibliography), if they are concerned about their privacy and/or security. Students will be given due notice, in the first week of the term and/or at the time assignment details are provided, about arrangements and alternatives for the use of Turnitin in this course.

It is the responsibility of the student to notify the instructor if they, in the first week of term or at the time assignment details are provided, wish to submit the alternate assignment.