

Department of Art

University at Buffalo

Fall 2022

Creative Coding

Instructor: Professor Marc Böhlen (mrbohlen@buffalo.edu)

Registration#: 22276, 3 credits

Location: CFA 136

Times: Tuesday / Thursday, 9:00 – 11:15

Office hours by appointment

Course description:

This undergraduate course will introduce Art&Design focused students to a variety of paradigms within creative computing. Creative coding means different things to different people. While designers often focus on visual aesthetics of code artifacts, this course will seek to expand the visual intelligence of design and consider procedural aesthetics of code artifacts. What is the program doing? We will read texts on the history of computing, synthetic systems, art and design as well as computer languages in parallel to writing code.

We will explore fundamental concepts in computing in three different computer languages: Javascript (P5js), Python and Julia. We will explore each of these systems for their conceptual and expressive capacity, and learn to appreciate how different computing paradigms allow for different kinds of artifact design. Students will learn to create a virtual computer on a remote server, and deploy that machine to tune into the flow of information on the web on a given day, or to craft a bot to respond to a favorite Reddit feed.

Course materials:

All reading materials and assignments, including exam guidelines and preparations, will be available on UBLearn.

Requirements:

Curiosity, basic coding skills, ART250 or equivalent

Deliverables:

- a) 4 Exercises
- b) 1 Final project

Grading:

a – 60%; b – 40%(total 100)

Grading scale:

100–90: A; 89–80: B; 79–70: C; 69–60: D; less than 60: F

GitHub repository:

<https://github.com/realtechsupport/CreativeCoding>

General learning objectives:

- 1) Become familiar with and competent in three different computing languages.
- 2) Develop appreciation for the varied circumstances in which creative practices in computing can occur.
- 3) Appreciate the history and ongoing rapid changes in the landscape of computing systems.

Assessment:

- 1) These skills will be tested in exercises 1 through 4.
- 2) These abilities will be tested in the exercises and evaluated in the final project.
- 3) This knowledge will be evaluated in the final project.

Preliminary course schedule (subject to changes):

Week	Date	Topic	Deadlines
1	30/8	Introduction: course overview	
1	1/9	What is creative coding ?	
2	6/9	JAVASCRIPT: basic ideas	
2	8/9	JAVASCRIPT: variables	
3	13/9	JAVASCRIPT: flow of control	
3	15/9	JAVASCRIPT: functions	
4	20/9	JAVASCRIPT: interactivity	
4	22/9	JAVASCRIPT: graphics and animations	
5	27/9	JAVASCRIPT: games	Exercise 1
5	29/9	PYTHON: basic ideas	
6	4/10	PYTHON: variables	
6	6/10	PYTHON: flow of control	
7	11/10	PYTHON: functions	
7	13/10	PYTHON: data structures	
8	18/10	PYTHON: interactivity	
8	20/10	PYTHON: data visualization	Exercise 2
9	25/10	PYTHON: web scraping	
9	27/10	PYTHON: image processing	
10	1/11	PYTHON: image processing	
10	3/11	PYTHON: image processing	Exercise 3
11	8/11	JULIA: basic ideas	
11	10/11	JULIA: variables	
12	15/11	JULIA: flow of control	
12	17/11	JULIA: functions	
13	22/11	JULIA: data structures	
13	24/11	JULIA: parallelism	Exercise 4
14	29/11	JULIA: numerical computing	
14	1/12	Project development	
15	6/12	Project development	
15	8/12	Project development	
16	13/12	Project presentations	Semester project

All reading and presentation materials are available on UBLearn.

Learning Outcomes and Assessment

The course will allow non-engineering students to get a grasp on fundamental computing ideas and approaches, specifically related to creative practices. Student progress will be assessed in adhoc mini-assignments (replicating class exercises, exercises in which the students move from replication to variation) as well as in a final project in which students define a design goal and use at least two of the programming languages introduced to implement their idea.

The main learning outcomes each student should achieve are:

- 1) *Grasp important fundamental concepts in computing.*
- 2) *Appreciate the various paths along which computing intersects with existing creative practices and can become a creative endeavor in its own right.*
- 3) *Understand basic principles of three different programming languages. Ability to implement select concepts in three different programming languages.*
- 4) *Appreciate the history of computing systems and the individuals who contributed to it.*

The table below describes the learning outcomes and assessment approaches on a topic by topic level.

Topic	Learning Outcomes	Assessment
1) Basic computing concepts	Understanding of select fundamentals of computing.	Exercises
2 and 4) Computing and creativity	Understanding of how computing and creativity intersect.	Exercises, Final
3) Javascript P5js	Ability to write code in this language.	Exercises
3) Python	Ability to write code in this language.	Exercises
3) Julia	Ability to write code in this language.	Exercises
FINAL EXAM	Design and execution of a creative computing project.	Final

UB Portfolio

If you are completing this course as part of your UB Curriculum requirements, please select an 'artifact' from this course that is representative of your learning and save it in a safe location with a clear title. Your final UB Curriculum requirement, UBC 399: UB Curriculum Capstone, will require you to submit these 'artifacts' as you process and reflect on your achievement and growth through the UB Curriculum. Artifacts include homework assignments, exams, research papers, projects, lab reports, presentations, and other coursework. For more information, see the UB Curriculum Capstone website: <https://www.buffalo.edu/ubcurriculum/capstone.html>.

Attendance policy

If you are absent, it is your responsibility to review the class schedule to be aware of all current and upcoming projects. Contact the instructor if you have questions regarding the class at the time of your absence. If you have an excused absence, discuss this with the instructor via email or in person.

Students are permitted 3 unexcused absences without penalty. After a third unexcused absence, 10% or one letter grade will be deducted per unexcused absence. A student with more than 5 unexcused absences will fail the course.

Relevant UB Policies

- **Academic Integrity**
Students are required to comply with the University's policy on Academic Integrity, found on the university website: <https://academicintegrity.buffalo.edu/policies.php>. The following actions, among others listed in the policy, constitute academic dishonesty: Work submitted to other courses; Plagiarism; Receiving major assistance completing an assignment without acknowledging that assistance; Falsification of academic materials; Misrepresentation of documents; Selling or purchasing academic assignments. The sources of all quoted or appropriated material must be credited.

- Accessibility

UB respects and welcomes students of all backgrounds and abilities. In the event you encounter any barrier(s) to full participation in this course due to the impact of disability, please contact the Accessibility Resources Office. The access coordinators in the Office of Accessibility Resources can meet with you to discuss the barriers you are experiencing and explain the eligibility process for establishing academic accommodations. You can reach the Office of Accessibility Resources through www.buffalo.edu/studentlife/accessibility; (716) 645-2608; 60 Capen Hall.

- Wellness

Sexual Violence: UB is committed to providing a safe learning environment free of all forms of discrimination and sexual harassment, including sexual assault, domestic and dating violence and stalking. If you have experienced gender-based violence (intimate partner violence, attempted or completed sexual assault, harassment, coercion, stalking, etc.), UB has resources to help. This includes academic accommodations, health and counseling services, housing accommodations, helping with legal protective orders, and assistance with reporting the incident to police or other UB officials if you so choose. Please contact UB's Title IX Coordinator at 716-645-2266 for more information. For confidential assistance, you may also contact a Crisis Services Campus Advocate at 716-796-4399.

- Mental Well-Being

As a student you may experience a range of challenges that can cause barriers to learning or reduce your ability to participate in daily activities. These might include strained relationships, anxiety, high levels of stress, alcohol/drug problems, feeling down, health concerns, or unwanted sexual experiences. Counseling, Health Services, and Health Promotion are here to help with these or other issues you may experience. You learn can more about these programs and services by contacting:

Counseling Services:

120 Richmond Quad (North Campus), 716-645-2720

202 Michael Hall (South Campus), phone: 716-829-5800

Health Services: Michael Hall (South Campus), 716- 829-3316

Health Promotion: 114 Student Union (North Campus), 716- 645-2837

- Emergencies

In case of emergency, call University Police, 645-2222.

A first aid kit is located in CFA 142. An AED is located in the hallway opposite CFA 136 and elsewhere throughout most buildings on campus. In the event of a medical emergency, confirm that the environment is clear of hazards, begin first aid/rescue if qualified, have someone retrieve the AED and phone 645-2222. AEDs (automated external defibrillators) are a critical life saving devices used in cases of cardiac arrest, and must be used by trained personnel only. Several CFA staff in the EP/GD area have been trained in the operation of the AED, including Daniel Calleri (CFA 123), Dom Licata (CFA 139) and Vince Harzewski (CFA 103).