"The limits of my language mean the limits of my world."

– Ludwig Wittgenstein

"The process of preparing programs for a digital computer is especially attractive, not only because it can be economically and scientifically rewarding, but also because it can be an aesthetic experience much like composing poetry or music."

– Donald Knuth

CREATIVE PROGRAMMING 1

DETAILS

Instructor	Prof. Jeff Thompson
Email	jeff.thompson@stevens.edu
Office/hours	Morton 208, Tues/Thurs 2.30–3.30pm
Meeting times	Thursdays 9.00am–12.50pm
Location	Visual Arts & Technology Lab
Course materials	www.github.com/jeffThompson/ CreativeProgramming1

COURSE DESCRIPTION

In this class, we will explore the computer as a tool capable of powerful creative possibility, not via pre-built software, but instead by writing code ourselves. We will look at the basic structures and affordances of code as inspiration for making artworks, as a tool capable of creating things that would be impossible by hand, and as a fallible system that encapsulates our cultural and personal biases.

During the course of the semester, you'll learn how to write code for a variety of visual projects including image, text, animation, and interaction. We'll primarily be using the Processing platform, a toolkit created specifically for artists and designers built on the language Java, and a brief exploration of Python as a tool for building Twitter bots.

Along the way, we'll also look at historical and contemporary figures in the arts and computer science who have shaped how we use computers as creative tools, and we'll explore code from a critical, humanistic perspective.

We'll be starting from scratch, so if you don't know anything about writing software that's totally ok! For those that have experience coding, we'll be using ideas from graphics programming that might be new to you, and I encourage you to take the cool things you know and apply them to our projects. For everyone in the class: talk to and help each other. Classes shouldn't be one-way information machines, but a way to share ideas and skills between each other.

ATTENDANCE

Because this class will cover so much technical material, and because our process of experimentation and critique is collaborative, attendance is mandatory. You are allowed two absences per semester to use at your discretion – each additional absence will result in your final grade being lowered by ½-letter. Late arrivals will be marked tardy, with 3 tardies equaling one absence. The only exception is severe illness – if this is the case, please let me know as soon as possible and provide a doctor's note documenting your illness.

HOMEWORK

Homework in this class is meant to be exploratory, a way to expand on the experiences and ideas in class. I encourage wide-ranging interpretation of assignments: consider ways that you can complete the project that are creatively and intellectually exciting for you, not fulfilling the basic requirements. (That said, some assignments will have restrictions on them – these kinds of constraints can spur creativity, so embrace them!)

You should expect the material to be rigorous and thorough. Unlike tests, projects require considerable engagement and thoughtful work on your own, and I want to see you working each week on projects. All assignments are due by the start of class and should be turned in on Canvas –details of projects will be available on the class GitHub page (see link on the first page of this syllabus) including details about how to turn in specific projects, what's to be included, etc.

You will have 24/7 access to the Lab and Studio, and use of the Fab Lab during open hours for printing and equipment checkout.

GRADING

The goal of all assignments is for you to think and make. Everyone comes from a different background and experience, so I'll be looking for improvement, curiosity, engagement, and a willingness to experiment. A grading rubric will be provided with each assignment to help you understand what is expected and how you did.

To get a C (an average grade) you should:

+ Put time into your projects each week

+ Complete everything on time

+ Participate in critiques and discussions

For a B or an A, you should additionally:

+ Take risks and try things enthusiastically

+ Be an active and unsolicited participant in critiques and discussions

+ Take assignments beyond their minimum requirements

Final grades will be determined as follows:

+ Homework: 50%
+ Quizzes: 10%
+ Class participation: 25%
+ Final project: 15%

REQUIRED MATERIALS

Required and suggested readings will be provided as PDFs on GitHub – there is no required textbook.

+ Laptop capable of running Processing/Java and with reliable internet connection, plus a charger – *bring every week, please!*

+ A notebook or sketchbook for taking notes and drawing ideas – *bring every week, too!*

+ Some kind of writing implement – an assortment of various pens and pencils may be helpful for working on project ideas

+ Other art supplies (paper, etc) and printing as needed

LEARNING ACCOMMODATIONS

The goal of this class is for everyone to succeed. Stevens and the VA&T program are dedicated to providing appropriate accommodations to students with documented disabilities. The Office of Disability Services (ODS) works with undergraduate and graduate students with learning disabilities, attention deficit-hyperactivity disorders, physical disabilities, sensory impairments, psychiatric disorders, and other such disabilities in order to help students achieve their academic and personal potential. They facilitate equal access to the educational programs and opportunities offered at Stevens and coordinate reasonable accommodations for eligible students. These services are designed to encourage independence and self-advocacy with support from the ODS staff. The ODS staff will facilitate the provision of accommodations on a case-by-case basis.

If you have any questions about learning accommodations, please don't hesitate to talk with me during or outside of class.

PRONOUNS

As this course includes lots of interaction between students, it's important for us to create an environment of inclusion and mutual respect. This includes the ability for all students to have their chosen gender pronouns and chosen name affirmed. If the class roster does not align with your name and/or pronouns, please inform me of the necessary changes.

INCLUSION STATEMENT

Stevens and the VA&T program believe that diversity and inclusiveness are essential to excellence in academic discourse

and creativity. In this class, the perspective of people of all races, ethnicities, gender expressions and gender identities, religions, sexual orientations, disabilities, socioeconomic backgrounds, and nationalities will be respected and viewed as a resource and benefit throughout the semester. Suggestions to further diversify class materials and assignments are encouraged. If any course meetings conflict with your religious events, please do not hesitate to reach out to me to make alternative arrangements.

COURSE CALENDAR

Please note this is subject to change – be sure to check GitHub and your email regularly. Homework and readings are listed for the days they are assigned.

Topics noted with ⊨ are short explorations of topics that jump off from or surround programming in a creative context. The symbol ⊨ is used in the field of logic to mean that an idea semantically entails another.

WEEK 00: INTRODUCTION && BOOTING UP

In class:	Hello, introductions and syllabus, instruction-drawings
Reading:	*Computer Graphics* (Mohr)
Homework:	Install Processing (from processing.org), test to make sure it works, Instruction Drawings

WEEK 01: DRAWING && COORDINATE SYSTEMS

In class:	Creating sketches, "Hello World," RGB color, drawing shapes, fill and stroke, saving images, getting help
Homework:	Drawings of Robots

WEEK 02: ITERATION && LOOPS

In class:	For loops, nested loops, driving parameters with loops, push/popMatrix(), creating functions, historical quilt research
Homework:	Algorithmic Quilts

WEEK 03: RECURSION && FRACTALS

In class:	Creating recursive functions, Pythagoras Tree, Koch Snowflake, the pixel array
Homework:	Recursion Exploration

WEEK 04: TIME

In class:	Conditionals, strings, fonts and text, exporting video files
Reading:	Excerpts from *Coding Freedom* (Coleman), *Debian Constitution*
Homework:	Clocks

WEEK 05: INTERACTIVITY 1
(And ⊨ Open Source)

In class: Discuss readings, contributing to open source projects, mouseX/Y, mousePressed()/Dragged(), background with alpha, importing fonts
Homework: Animated Letterforms

WEEK 06: RANDOMNESS 1

In class: random(), map() and constrain(), arrays, writing to PDF
Homework: Begin Randomness project, install Python

WEEK 07: RANDOMNESS 2

In class: Cellular automata, work day, check if Python is working for everyone
Homework: Finish Randomness project

WEEK 08: LANGUAGE 1

In class: Creating a Python script, printing "Hello World," running a script in the Terminal, loops and conditionals, lists, cleaning text, templating strings, saving to file
Homework: Begin Bot project, create a Twitter account

WEEK 09: LANGUAGE 2

In class: Installing Python modules, creating an app on Twitter, OAuth, posting to Twitter automatically, bot sever demo
Reading: Selection from *10 PRINT CHRS…*
Homework: Finish Bot project

WEEK 10: ⊨ CRITICAL CODE STUDIES

In class: Reading code as text, porting code as critical research
Homework: Historical Code Explorations

WEEK 11: INTERACTIVITY 2

In class: Simulating motion, object-oriented programming, ArrayLists
Mini project: TBA
Homework: Final Project proposal

WEEK 12: INTERACTIVITY 3

In class: More simulation and interactivity
Mini project: Finish mini project in class
Homework: Rough Final Project prototype

NOV 22–26
Thanksgiving break – no class!

WEEK 13: WORK DAY

In class: Work on Final Projects, get help as needed
Homework: Continue working on Final Project

WEEK 14: WORK DAY

In class: Work on Final Projects, get help as needed
Homework: Finish Final Project

EXAM PERIOD: FINAL CRITIQUE
Date TBD, please don't book travel until after exam period ends!

In class: Crit and goodbye