

Computer Programming 2018-2019

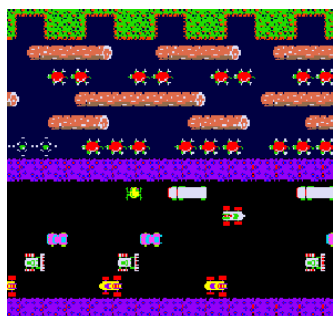
Sessions 1&2, M/W 1:30 PM - 2:45 PM

Tim Handley, Instructor

Syllabus v1.10 (2018.10.17)

Course Overview:

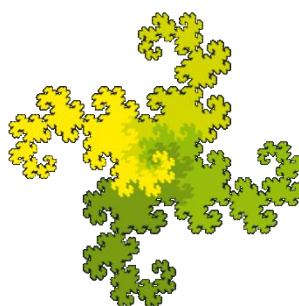
A STEAM-y, project-based introduction to the art, craft, and imaginative application of computer programming. Where traditional math and programming classes step through concepts in a plainly pragmatic manner, we will help students learn programming by engaging with both everyday and out-of-the-box concepts. Using geometry, logic, and system events, students will build homemade editions of classic games. With control structures and subroutines, they will create code-making and code-breaking tools. With abstraction, intuition, and clever design, they will explore various ways to create beautiful fractal structures.



Frogger

Decryption shift	Candidate plaintext
0	exxegoexsrgi
1	dwdfndwrqfh
2	cvvcemcvqpeg
3	buubdlbupodf
4	attackatonce

Caesar Cipher



Dragon Curve



Fractal Fern Leaf

In this work, we will use [Scratch](#) - a remarkably accessible and powerful programming system developed by MIT. Scratch is a free, web-based development environment that runs well on just about any modern laptop, and on most Chromebooks. No software installation is necessary, just an internet connection and a web browser.

Course Materials:

- **BYOL - Every student must bring a laptop to every class**
- Single subject spiral bound notebook (look for 80+ pages)
- Pencil and eraser
- Edmodo account (student and parent both)

Course Expectations:

- Attend all classes unless ill.
- Arrive on time and prepared.
- Be mindful of yourself and your behavior.

Grades, Tests, and Homework:

This will be a semi-formal class. There will be 2-4 formal tests, spaced evenly throughout the two sessions. The goal of the tests will be to help students check their learning, and make sure that they are on track to be fully successful in the class - able to finish their projects with pride and panache.

Students will have daily homework assignments, for a total of 2-4 hours of homework per week. All assignments will be important to achieving learning goals and creating successful projects.

Schedule of topics and activities*

* Details may change according to students' needs and interests

Session 2

- Week 1: Turtle Geometry
Keyboard Events & Cartesian Geometry
- Week 2: Costumes and Animation
Loops
- Week 3: Game Project
- Week 4: Game Project (cont.)
- Week 5: Intro to variables
- Week 6: List-type variables
- Week 7: Review
Exam #1

Session 2

- Week 1: List-type variables (cont.)
Substitution cyphers
- Week 2: Blocks (a.k.a. functions)
Caesar Cyphers
- Week 3: Rotating cyphers
- Week 4: Recursion
Sierpinski's Triangle (Fractal #1)
- Week 5: Recursion (cont.)
Koch's Snowflake (Fractal #2)
- Week 6: TBA
- Week 7: Final project / TBA
- Week 8: Deliver final project
Final Exam