

HappyCoding 2017 Spring Course Descriptions

Computer Science Fundamentals (20 weeks, 1 hour/week)

Course 1 &2: (ages 5-8)

- Early-readers
- Sequences
- Loops and events
- Meaningful collaboration with others
- Problem-solving and perseverance techniques
- Internet safety
- Conditionals
- Algorithms
- Binary code
- Debugging
- Societal impacts of computing

Game and Robotics (10 weeks, 1 hour/week)

• Game Design with Scratch (ages 5-9)



This course teaches the visual programming language Scratch, which was developed by MIT. Scratch uses a drag/drop paradigm and blocks to do programming so it can be easily learned without requiring much typing. In this course, students will have fun designing and implementing games using animations, loops, variables, conditional statements, etc. while obtaining a stepping stone to the more advanced world of computer programming. Our curriculum introduces powerful ideas from engineering and computer science that are not usually highlighted in early childhood education.

All materials will be provided for this class.

Prerequisites: None

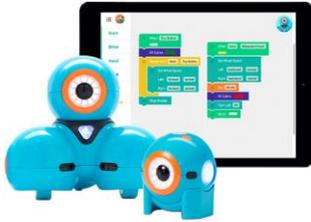
• Scratch2 (ages 9-11)

This course is the next level of Game Design with Scratch. The class is project-based. Students will use the characters, animations and videos to design their own stories, and learn how technology is used in the film and media industry. Our curriculum introduces powerful ideas from engineering and computer science that are not usually highlighted in early childhood education.

All materials will be provided for this class.

Prerequisites: None

• Coding with Wonder Robotics (ages 5-9)



Meet Dash & Dot, the colorful robots from award winning Wonder Workshop, then discover the exciting world of coding. Wonder Workshop introduced Dash & Dot in December 2014. They are robots targeted at teaching creative problem-solving and computational thinking. All materials will be provided for this class.

Prerequisites: None

Intermediate Level Courses (10 weeks, 1 hour/week)

- **Website Dev 1 (ages 9-14)**

In this course, you will learn website basics by completing fun projects! From an interactive poster, birthday music card to a web calculator and more! We will cover HTML tags, CSS styles and some JavaScript. We teach our classes with a non-traditional pedagogical methodology. It emphasizes concrete hands-on experiences and self-paced learning progression. In other words, students get to know how things work by observing and copying from examples, by doing them without theoretical explanation beforehand. Only after students have gained considerable practical experience dealing with a concept do we introduce the concept in its theoretical dimension.

Prerequisites: None

- **Advanced Web Dev with HTML5/CSS/AngularJS (ages 14+)**

This is a continuation of the Web Site Dev 1 course. It will continue the keyboard and mouse controls in JavaScript, further cover HTML5 and CSS3 and include Angular JS. All those are done by developing and completing fun games!

Prerequisites: Website Dev 1 or equivalent

- **Python1 (ages 11+)**



Learning a programming language that can be applied in real world scenarios such as Python is very different from teaching a block-based visual programming languages such as Scratch. It can be a major challenge because students need to learn many things at once: how to type, to format code, to master the formal syntax, to think in a computational fashion and to understand some basic concepts in computer science. Often times these hard works don't pay off if the learning process itself is not strongly motivated.

The special of our course is it adopts CodeCombat, a platform that offers real coding from the very first level. More importantly, it shapes the learning process into a continuous challenge to beat the game so as to keep students thoroughly engaged. By the end of the unit students will be able to: correctly format code in Python, call methods, pass arguments to their methods, handle exceptions, file I/O, etc.

All materials will be provided for this class.

Prerequisites: None

- **Python2 (ages 11+)**

This is the second course in the Python series. In this unit students will reinforce the techniques learnt in the last unit: loops, conditionals, objects and methods, functions. They will also explore more data types such as the list, dictionary and array and learn how to manipulate them. They will need to combine this new concept with loops to create code that can count and keep track of changing variables. This will give them all the pieces they need to go through a list of data and filter only the data they need to act on.

All materials will be provided for this class.

Prerequisites: Python1 or equivalent

- **Magic Circuit (ages 10+)**



In this course we cover the fundamentals of electrical and electronic components like capacitors , resistors , potentiometers, diodes, transistors, timers and batteries. Students will work on small projects that use above components along with many other devices. By the end of the course students will be able to understand the concepts of electronics and how the electronic devices work.

Prerequisites: None

Advanced Level Courses (10 weeks, 2 hour/week)

- **Java 1 (ages 14+)**

This class introduces the principals of object-oriented programming and teach you software engineering concepts and methods. You will learn variables, data and types, statement and blocks, control flows (branch and loop), Exceptions, Class, interfaces, etc. By the end of the class, you will get ready for AP Computer Science Test.

Prerequisites: None