

## Exploring Computer Science

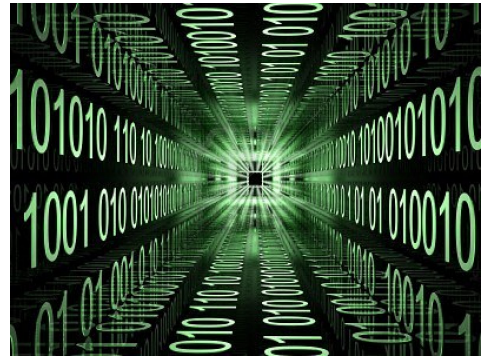
Mr. Harrington

<http://technologyclass.org>

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### Course Description:

Exploring Computer Science (ECS) is the 1st level in a two-course series that is being offered at SHHS; The 2nd level is Computer Science Principles (CSP). The students will acquire a hands-on understanding of a number of Tech Fields, in particular: Programming, Computer Science, Artificial Intelligence, Robotics and Engineering/3D Printing. Students will also be exposed to career opportunities in the Tech Sector by being offered internships and a guest speaker series provided by industry tech leaders. The Goal: Get the students excited about the Tech. Sector so that they may consider it as a career. Thus, this course is designed to be intriguing, challenging...and fun!



### Course Content

#### Phase #1: Computer Science

1. Hardware: Student will understand how a computer functions and eventually piece together a computer for a client.
2. Digital Communication: The internet, privacy, security and data.
3. Process: Students will engage in activities that will focus on organizational & problem solving skills and attention to detail. Students will develop an understanding of Artificial Intelligence, Binary & Linear Search, sorting algorithms and Minimal Spanning Trees.

#### Phase #2: Programming

1. Building Web Pages & Graphics (Attention to detail & syntax error.)
2. Block Coding
  - Students will learn the foundational concepts of C++ and then will design and code an online computer game using Scratch.

#### Phase #3: Robotics

Students will design and code Lego Robots to compete in a number of activities.

#### Phase #4: Engineering & 3D Printing

Students will design and build radio-controlled cars using a CAD program and 3D printers. They will race the cars on a number of tracks of their choosing around the campus. The students continually change the design and reprint their cars again and again in order to improve their cars performance.

### Careers

A major component of this class is to expose the students to many of the career opportunities available to them in the tech sector and to learn what it takes to become employed with many of these firms.

#### Internships:

- Students can apply and be awarded an internship with the S.H.U.S.D. IT Department where they will acquire a broad range of hard and soft skills.

#### Guest Speaker Series:

- Tech leaders from a variety of fields visit the students and tell them about growing up, college, what they do and advice (Every Friday for eight weeks in the Spring).

#### Field Trips

- Computer History Museum
- Google
- NASA

#### Job Interviews:

- Students practice writing a Cover Letter & Resume and then take part in a Mock Interview.

#### Industry Certifications

- Students can take a test that will allow them to acquire an Industry Recognized Certification in Computer Science.

## Partners

Although I may be guiding the classes, a tremendous amount of the learning and support comes from the students themselves. Students will be working with other students through most of the course.

## Class Conduct

- Phones are to be placed in the class cubby upon entering class.
- The moment the bell rings be in your seat.

### Also:

- Bathroom (Bladder Control) – Just ask.
- Roaming the Room – The only students who should be out of their seats are those who are helping others. If you want to help someone, just ask.
- Food & Drink – water is ok...anything else, please wait till class is over.
- Other Class Assignments – Other class assignments are not to be done during class time.

## Missed Assignment Guidelines

- This is a self-paced class. It is designed so that if you are away, or you just need more time to work on a project, I will always except your work – my goal is for you to acquire and apply as many career related skills as possible.

## Class Materials:

Tech Folder & Earbuds.

## Availability:

I will always make myself available to assist you...just ask.

## Grading Policy

The class Grading Policy allows all of my students to move at their own speed and get credit for what they have achieved. As they complete certain projects, they get credit and when they complete the next project, their grade is raised to match their accomplishment. There is no subjectivity to this grading system and it's very clear to the student what they need to achieve to attain certain grades. The assignments build in complexity, so students must complete the "C" assignment before moving on to the "C+" assignment, etc.

### **First Semester**

- C-: Computer Components Test & Build a Client Computer.
- C: Binary /Semiconductors /Silicon Valley Test.
- C+: Web Page 1&2 / Website 1&2.
- B-: Files & Folders / Text Wrap 1&2.
- B: Tables & Lists 1&2.
- B+: Photoshop 1&2.
- A-: Resort Website
- A: Cascading Style Sheets.

### **Second Semester**

- C-: Scratch Program 1-9
- C: Scratch Program 10 - 21
- C+: Scratch Program 22 - 28
- B-: Final Coding Project
- B: Tinkercad Training, Peg Cube Sphere, Fast Car.
- B+: RC Car: Base, Battery M, Servo M, Transformer M, Wheels.
- A-: RC Car: Steering R, Lower Steer C, Upper Steer C, Motor M, Assemble and Drive!
- A: Lego Robot: Assemble, Hand Code Sensors, Maze, Computer Code, Parking Lot.