

Pompano Beach High School
Exploring Computer Science
Course Syllabus 2016 - 2017

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Course Description:

Computing is involved in nearly every field of study, career and industry today. Exploring Computer Science (ECS) is a high school course that provides students with an introduction to the world of Computer Science. The course consists of 6 units which are approximately 6 weeks each. Assignments are inquiry and equity based and designed to be socially relevant and meaningful for diverse students. Units utilize a variety of tools/platforms, and culminate with creative final projects around the following topics: Human Computer Interaction, Problem Solving, Web Design, Introduction to Programming, Computing and Data Analysis, Robotics.

Prerequisite: Completed Algebra.

Course Sections

- Computers and the internet
- Models of intelligent behavior
- Algorithms and abstraction
- Connections between mathematics and computer science
- Creating computational artifacts (web pages, programs)
- Data and information
- Societal impacts of computing

Evaluation

There will be a minimum of 9 grades per quarter. A grade can be an assignment or a quiz/test. Assignments will be evaluated on final output along with teamwork and each grade is weighted based on the project's size and complexity. I do not "bump" grades, thus, if a student receives an 89.9% for a particular quarter, I cannot bump his grade to an A. I do not calculate the grade, the Pinnacle grading system does this based on the weight of each grade. The students must therefore give their best performance for each assignment/quiz in order to ensure they receive the best grade possible.

Academic dishonesty (cheating of any kind) will result in a grade of 0%. There will be no exceptions on this as my students well know. Please recognize that a 0% is not the same as an F. An F is 59% or below which is much easier to recover from than a 0%. For example, obtaining a 0% for an assignment and 100% on ALL remaining assignments in a quarter will result in a final grade of 88.9% (for 9 grades which are all equal weight).

Attendance:

1. Coming to class on time everyday is required. I do not allow students to come into class late with the excuse that their prior teacher held them or that they "come all the way from the portables". On time means being seated and ready for work. No exceptions.
2. If you must be absent from any class, make sure it is excused immediately.
3. It is your responsibility to obtain missing assignments, complete them on your own time and submit those to the instructor within the allotted time for a grade.
4. You are responsible for all material presented in class. Tests, quizzes, notes, often include questions on material presented only in class, so performance on these indirectly reflects attendance.
5. All work must be handed in on time for full credit.

Classroom Behavior:

1. Be seated and ready to work at the sound of the tardy bell to avoid a tardy. Remember, in your seat.
2. Have a positive and serious outlook towards each assignment. I will focus to make each assignment fun, interesting and challenging. I will work each day to be the best teacher I can be. I expect you to be the best student YOU can be.
3. It will be crucial for you to pay attention as I either discuss the assignment or model the assignment for you at the beginning of the day so that you know what is expected from you.
4. Individual work must be approached on your own. If you are having trouble, ask me. I am here to help you be successful. For group work, be part of the team and do not expect others to do the work for you. You will be graded on this. Do not refuse to work with students you don't know, you might just be missing out on your new best friend! If you have issues with any student, then see me. I will "try" to accommodate you.
5. Begin and complete your daily assignment on time. If you complete the assignment, continue to expand your efforts and knowledge on the subject at hand. You can always repeat the assignment as repetition is the path to mastery.
6. Non-class related activities, such as games, Internet browsing, etc, removes the focus on the material being learned and dilutes the effects of the lesson.
7. Disruptions, lack of respect, unwanted chatter, pranks, insubordination, etc. will not be tolerated. This class does not belong to any one student but is instead "our" class. Be respectful of others.
8. Make sure you go to sleep on time because sleeping is obviously not allowed.

Class Rules:

1. No jump drives, phones, music listening devices of any kind are allowed to be used. They will be taken on sight!
2. No food, drinks, and chewing gum are allowed in sight. Food/Drinks will be taken on sight.
3. School Phone policy is strictly enforced. I am allowing the privilege for you to charge your phone but it must not be seen. If I see your phone at any time it will be taken.
4. Complete all the assignments on time to earn all the points. The assignment must be completed when I come and grade it. If it is not, you will receive the partial grade per the rubric. To avoid this, have your assignment completed.
5. No standing before the end of the class (as in waiting for the bell). Do not move to a desk that is closer to the exit door. Violating this policy will result in a detention and further discipline.
6. Consequence for sleeping is a detention.
7. Do not use the back-door in our class. This can cause injury to students walking the hall. Using this door will result in a detention.
8. This class requires you to have an open outlook, an inquisitive mind, and the will and focus to do the very best you can. Bring this with you everyday and you will be successful!

Textbook: None

Supplies:

- Writing utensil
- A Composition notebook

Student: If you have any problems or questions, please feel free to make an appointment with me, or email me. Assistance can be arranged with me for after school. **I CANNOT HELP IF YOU DO NOT ASK!**

Detentions will be given for any disciplinary infraction. The student will have 2 weeks to serve the detection. Failure to serve the detection will cause referral to administration.

Parent/Guardian: Please check with your child frequently to see how he or she is doing in class. It is important that you are aware of his or her progress. If you have any question, please email me, and I will do my best to respond to you in a timely manner. I will post grades as quickly as I can on Pinnacle.

Thank you,
Mr. Roscioli

We understand and accept the rules and expectations of the **ECS** class.

Please return this portion by September 1st, 2016.

STUDENT'S NAME _____ DATE _____

STUDENTS SIGNATURE _____

I have read and discussed this syllabus with my child.

PARENT/GUARDIAN'S NAME _____

PARENT/GUARDIAN'S SIGNATURE _____

HOME ADDRESS _____

HOME PHONE _____ WORK PHONE _____

CELLULAR PHONE _____ EMAIL ADDRESS _____



I understand and accept the rules and expectations of the **Coding** class.

Please return this portion **today**

STUDENT'S NAME _____ DATE _____

STUDENTS SIGNATURE _____

PARENT/GUARDIAN'S NAME _____

HOME ADDRESS _____

HOME PHONE _____ WORK PHONE _____

CELLULAR PHONE _____ EMAIL ADDRESS _____

Human Computer Interaction Unit Overview	
Instructional Day	Topic
1-2	Explore the concepts of <i>computer and computing</i> .
3-4	"Demystify" and learn the function of the parts of a personal computer. Learn the terminology of hardware components necessary for the purchase of a home computer.
5-7	Explore the world wide web and search engines. Experiment with a variety of search techniques, internet resources, and Web 2.0, applications. Evaluate websites.
8-9	Examine the implications of data on society and how computers are used for communications.
10	Tell a story with data.
11-14	Explore how computers are used as a tool for visualizing data, modeling and design, and art in the context of culturally situated design tools.
15-16	Introduce the concept of a computer program as a set of instructions.
17-19	Explore the idea of intelligence—especially as it relates to computers. Explore what it means for a machine to "learn". Discuss whether computers are intelligent or whether they only behave intelligently.
Problem Solving Unit Overview	
Instructional Day	Topic
1-2	Introduce data collection and problem solving.
3	Introduce the four steps of the problem solving process.
4-6	Apply the problem solving process. Use different strategies to plan and carry out the plan to solve several problems.
7-9	Reinforce the four steps of the problems solving process.
10-12	Count in the binary number system. Convert between binary and decimal numbers in the context of topics that are important to computer science.
13-14	Introduce the linear and binary search algorithms.
15-16	Explore sorted and unsorted lists and various sorting algorithms.
17	Introduce minimal spanning trees and how graphs can be used to help solve problems.
18-21	Final projects and presentations

Web Design Unit Overview	
Instructional Day	Topic
1-2	Explore issues of social responsibility in web use as well as the relative merits of the influence of the web on society, personal lives, and education.
3-4	Introduce the use of basic html.
5	Introduce basic formatting in html.
6-7	Explore image editing for the web using Photoshop or an image editor of choice.
8-10	Introduce basic css.
11-13	Explore the concept of separating style from structure by keeping separate html and css files.
14	Add hyperlinks to other websites.
15-16	Introduce a variety of page layout styles.
17-19	Practice the use of various design elements.
20-21	Introduce several different enhancements for website design, including web user interface elements combining Javascript, html, css, and Photoshop, accordion menus, lightbox and sliding images.
22-23	Final projects and gallery walk.
Introduction to Programming Unit Overview	
Instructional Day	Topic
1	Introduce the Scratch programming language, including the basic terms utilized in the language.
2-3	Practice using the basic features of Scratch in the context of creating a simple program.
4	Create a dialogue between two sprites.
5-6	Introduce the methods of moving sprites in Scratch.
7-8	Practice the concept of event driven programming through the creation of an alphabet game.
9	Introduce the concept of broadcasting via role play.
10-13	Write Scratch stories and present them to the class. Conduct peer reviews.

14	Introduce the concept of variable.
15	Introduce the concept of conditionals.
16-17	Introduce And, Or and randomness.
18	Apply knowledge of conditionals to develop a Rock Paper Scissors program in Scratch.
19	Build on previous programming concepts to create a timer.
20-23	Create a timing game in Scratch and present it to the class. Peer reviews are conducted.
24	Investigate two types of games that may provide ideas for the final project.
25	Explain final project and the rubric for the final project.
26-28	Write Scratch programs for either My Community or Game project. Conduct peer reviews.
29	Complete final projects.
30	Presentations of final projects

Computing and Data Analysis Unit Overview

Instructional Day	Topic
1-3	Review how data can be used for making a case/discovery. Explore pitfalls and challenges of putting together and managing large sets of data. Provide an overview of the final project.
4-5	Explore possible research questions for a selection of sample campaigns. Validate compelling stories with research data.
6-7	Assign groups. Discuss group roles and responsibilities. Choose campaigns and modes for data collection.
8	Data check-in—Discuss issues that arise (aggregating data, etc.).
9-12	Create maps using the latitude and longitude of a location and then create maps from a file of data.
13	Create maps with student data and related data set.
14-16	Discuss bar plots, categorical and continuous data, and mosaic plots as a vehicle for comparing categorical data, and looking at trends in data.
17	Create bar plots and mosaic plots with student data and related data set.
18-20	Review mean, median, minimum, maximum. Discuss various ways to

	subset data. Represent data with box plots and histograms.
21	Identify mean, median, minimum, maximum, create subsets, and create box plots and histograms with student data and related data set.
22-24	Use a variety of filters and queries to create subsets of text data. Create bar plots to graphically display the information.
25	Analyze text in student data and related data set.
26-27	Finalize data analysis for final project.
28-29	Develop website or Scratch program to present data analysis campaign.
30	Final project presentations

Robotics Unit Overview

Instructional Day	Topic
1	What is a robot? Identify the criteria that make an item a robot.
2-3	Evaluate robot body designs and create algorithms to control robot behavior.
4	Set up LEGO® Mindstorms® NXT® kit.
5	Build robot base.
6-7	Introduce the features of NXT Brick—the “brain” of the robot.
8-9	Introduce the features of the Mindstorms NXT software.
10-13	Program the robot using the Mindstorm Robot Educator Software tutorials.
14	Introduce RoboCup real life robotic competition and write instructions for tic-tac-toe.
15	RoboTic-Tac-Toe Tournament and introduction to RoboCupJunior Dance Challenge.
16-18	Build, program, and present a dancing robot.
19-23	Build program and present a rescue robot.
24-33	Final projects and presentations