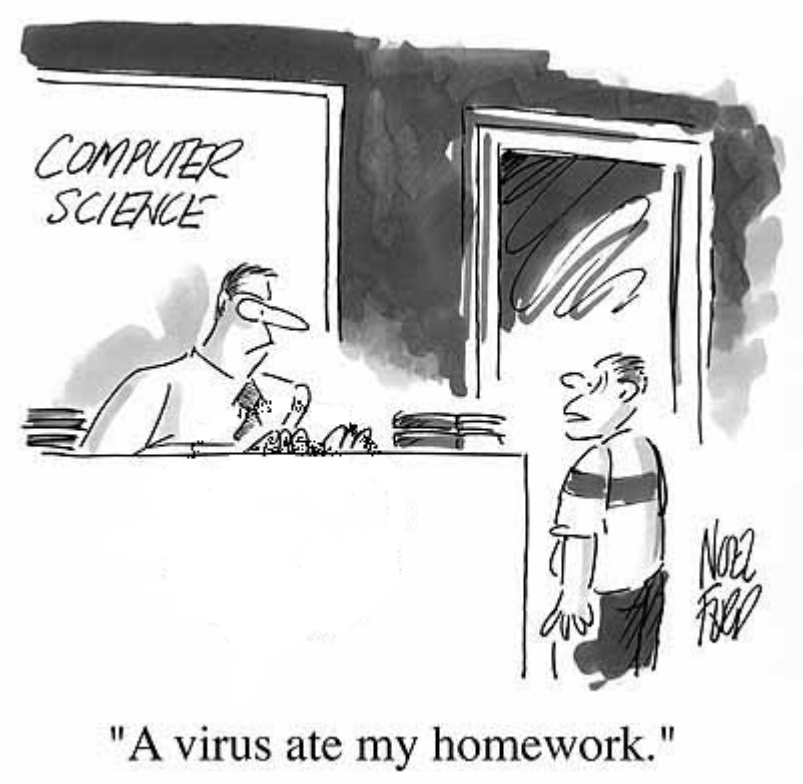
AP Computer Science A



"A virus ate my homework."

Columbus High School, 2015-2016

Instructor: Mr. Richardson

Class Website: http://columbuscompute.wikispaces.com

INTRODUCTION

Welcome to AP Computer Science. This course will prepare you for the College Board's exam for computer programming. The structure of this course will be slanted very heavily toward programming, and more programming. Since this is an AP course, I will assume that you are mature enough to always make sure you are using your time wisely. To get an A in this course and a "5" on the AP exam, you must consistently work. If you ever feel like you do not know what to do with your time, let me know.

Advanced Placement® Computer Science is a fast-paced course meant to duplicate a college introductory programming class. We will learn about the exciting kinds of problems tackled by computer science while exploring the field's most important tool – programming. Assignments covering a broad range of application areas will require approaching problems systematically to produce explicit sets of steps, algorithms, to solve them. We will also study common, reusable algorithms and learn to analyze them for correctness and speed.

This course will cover fundamentals of programming syntax and methodology using the Java programming language. Java is just one example of a language used to create software and we will focus on gaining general problem-solving and programming skills that can be applied to other common languages. No matter what field you choose to make your career in, this course will provide you with valuable insights into how to solve problems systematically, how computers work and how large projects are managed. So, this is not a JAVA class. It is a class in using a structure logic called Object-Oriented Programming (OOP) to solve problems.

GOALS

Successful completion of this course and its projects will prepare students for the AP® exam and for a second-semester college programming course. Students will be able to:

- identify and discuss the major hardware and software components of a computer system
- recognize the ethical and social implications of computer use and software creation
- design, implement and debug computer-based solutions to problems in diverse application areas
- use, implement and analyze common algorithms and data structures
- write clear and efficient code using good Java syntax and programming style
- know when and how to use Java library classes
- read, understand and contribute to large programs consisting of several classes

CLASSROOM ETIQUETTE

The general rule of thumb is that distractions will not be tolerated.

Do not change any settings on the computers and leave your station EXACTLY like you find it.

Computers will be used for Computer Science. Examples of what computers should not be used for include game playing, social media, email, shopping, or working on other class material. Students who cannot adhere to these rules will lose computer privileges and need to do work on paper and pencil and computer work at home.

ABSENCES

If you have an excused absence, it is absolutely your responsibility to complete all work and get all

missed work or notes to prepare for any future tests or quizzes. *In the unfortunate situation that you miss an exam*, **all make-ups will be scheduled after school**. All missed assignments must be scheduled to be made up on the day you return from an absence. In other words, if you have an excused absence, see me the day you return so we can schedule a make-up period. You must make arrangements to make up any work you miss due to excused absences. By not making such arrangements, you will receive no credit for the missed work (or tests/quizzes). Any missed work must be made up in a timely manner as specified in the student handbook.

ACADEMICS

Everyone will be expected to have a 1 inch presentation binder. You will keep all your lecture notes, homework, laboratory reports, and other class related materials in this notebook. The notebook may be collected on occasion with at least 24 hours notice.

Each individual grade will be scaled to the appropriate 10-point scale grade. The scaling will be done based on overall performance of the class as well as other factors. Below is the breakdown of your grade composition:

Major Tests	44%*
Quizzes, Homework	25%
Programs	20%
Final Exam	11%*

*If you do better on the final, it will take the place of your lowest test score. This option encourages you to re-learn material you did not grasp the first time. Note that this option can only help you!

Notes on Grade Calculations:

To make the final exam replace the lowest exam grade, the 4th 9 weeks exam will have the additional points over the lowest exam grade added to it.

The 4th 9 weeks grade has to be weighted more than the 3rd 9 weeks grade since the final exam grade is part of the 4th 9 weeks grade computation. The 3rd 9 weeks counts as 40% and the 4th 9 is 60% to make up the 2nd semester grade. This also applies to the semester grades so that 1st semester is 39% and the 2nd semester is 61%.

The end result is that the final exam can reward your grade by encouraging re-learning so these weighted percentages make it possible for the final exam benefit.

PROGRAMMING PROJECTS

You will have a programming assignment due at various times. It will be up to you to budget your time – I will give you opportunities to work in class but most assignments will require outside work as well. That means you will need to find access to a computer with a Java compiler. For most of the year, we will be using BlueJ which is a free JAVA IDE (links to software are on the class website listed on the front page of the syllabus).

COLLABORATION

The early programming assignments will be individual work. I do encourage you to talk to your classmates, parents or to me about how you are approaching a problem but ultimately the work you turn in must be your own. A good rule of thumb is that you should be speaking in English rather than in Java and should never look at someone else's code.

FINAL PROJECT

The final project will provide you with greater freedom in design and implementation. Project proposals will be submitted and approved in stages as the program evolves.

EXAMS

Our exams will prepare you for the AP exam in Computer Science. Even though we will be learning programming with the computer, the exams are paper and pencil. These exams typically ask you to fill in code snippets to do something you hopefully learned by actually using object-oriented programming. Some reference material will be provided just as with the AP exam. Before each exam, there will be a practice exam and a review to help you prepare.

COURSE CONTENT

Unit 1 – Intro to Computer Applications with Arduino Microcontrollers

Unit 2 - JAVA IDEs, hardware, Computer Ethics, and Hello World

Unit 3 - Classes, Objects, and Methods

Unit 4 - Conditional Logic

Unit 5 - Iteration

Unit 6 - Magpie Chatbot Lab

Unit 7 - Arrays

Unit 8 - Lists

Unit 9 - Elevens Lab

Unit 10 – Animations, Interfaces, and Polymorphism

Unit 11 – Recursion

Unit 12 – AP Exam Review

Unit 13 – Big Program Project