Welcome to...

AP Computer Science
Course Guidelines (Kaplan and Tiveron 2017 - 2018)

About this course...

AP Computer Science is a dynamic course designed to develop the fundamental skills necessary for success on the AP Computer Science A Exam. Beyond that, however, it is also a course that provides motivated students the opportunity to experience firsthand the enjoyment, challenge, and artistry of programming. Students who invest the necessary level of effort and time into the course will strengthen their ability to solve complex and abstract problems in both programming and non-programming contexts. In particular, the essence of this course is split into three general concentrations (underlined below):

1. By writing code, solving problems, and completing individual and team projects, students can expect to develop an understanding of the Java programming language sufficient at a minimum for preparation to take the Advanced Placement Computer Science exam.

2. By analyzing real-world case studies of already-written code, students can expect to receive an introductory glimpse of the project-development process commonly found in “the real world.”

3. By studying and mastering well-known programming algorithms and strategies, students can expect to develop good programming techniques that are independent of the particular programming language used.

AP Computer Science Required Course Materials

   (Publisher: John Wiley and Sons, ISBN #: 978-1-118-43112-2)
   Be Prepared for the AP Computer Science Exam in Java, (sixth edition) by Maria Litvin
   (Publisher: Skylight Publishing, ISBN #: 978-0-9824775-3-3)

2. AP Computer Science Course Materials (Downloadable folder)
   Available for free download from our Canvas course website. You will want to download this onto a flash drive and unzip all materials onto that same drive and your home computer.

3. A Flash Drive or access to Google Drive

Grading Policy Overview

Semester grades will be calculated with a breakdown of 80% in-progress semester work and 20% final exam. In progress semester grades will be calculated as follows:

   Assignments: 50%
   Assessments: 50%
Assignments
The nature of this course demands that students plan on spending a significant amount of time both during class and outside of class working on assignments given throughout the year. Therefore, it will be assumed that all students will have independent and daily access to a personal computer sufficient for completing assignments. (Any student for whom this is an issue should discuss this with his/her teacher outside of class to allow for alternative arrangements to be made.)

Assignments will primarily be programming assignments from the textbook or other resources but may also be paper and pencil code tracing assignments. Assignments will be graded for completeness and accuracy, however, as long as a student demonstrates sincere effort on a given assignment they will be given the opportunity to correct their work until it is functioning properly.

Students should also be aware that the District 113 Academic Honesty Policy will be strictly enforced in this course. While students are encouraged and in fact are expected to work together to help each other develop their understanding of structured programming in Java, **ALL SUBMITTED ASSIGNMENTS MUST BE ORIGINAL WORK** (NO EXCEPTIONS!)

Assessments
In order to best prepare you for the AP exam, all assessments will:
- be on paper and pencil (just like the AP test)
- be closed note, closed book, no calculator
- be cumulative due to the connectedness of course content
- be based on past AP test questions to simulate the complexity of the exam
- be a combination of multiple choice and free response

Attendance and Absences (Authorized and Unauthorized)
If you are absent from class you won’t be penalized for late assignments but you need to make up missing assignments in a timely fashion. If you are absent check Canvas to see what you missed and contact peers in your group to get any source code you may have missed. Peers in your group may also reach out to you to let you know what you missed. If you know before hand that you are going to miss a class contact your teacher to see what you are missing.

If you miss an assessment please contact your teacher to make a plan to make it up. If you know you are missing an assessment ahead of time make arrangements before the assessment to schedule a time to take it.

Receiving Extra Help in AP Computer Science
Please do not hesitate to get assistance when you are having trouble in class because it can be difficult to get caught up if you fall behind. Here are some resources:
- Classmates
- ARC CS tutor/CS tutor list posted on canvas
- Slack discussion board
- Google/YouTube/StackOverFlow/Textbook
- Your instructor
  Ms. Kaplan’s school e-mail address: mkaplan@dist113.org
  Mr. Tiveron’s school e-mail address: dtiveron@dist113.org

One Last Note...
We are excited to have you in class and hope that you are looking forward to the challenge of learning how to program. Whatever it turns out to be for you, we are looking forward to being a part of the process.

-Ms. Kaplan and Mr. Tiveron
AP Computer Science Learning Standards

I can articulate the functionality of the compiler and the JVM
I can write a basic java application using the PrintStream class
I can distinguish between compiler, run-time, and logic errors and identify how to correct them
I can identify the different primitive data types and use them appropriately
I understand the relationship between a class, an object, and a method
I can construct object references and call its methods in client applications in order to perform tasks
I can create a class by declaring its instance variable(s), constructor(s), and method(s) while being aware of the scope of all variables used in the class
I can use the String class, the Math class and the Random class
I can perform arithmetic operations using java's arithmetic operators
I can use the Scanner class to obtain input from the user
I can manipulate strings and format how to display output to the terminal window
I can use if...else statements with relational operators to make decisions
I can use if...else statements with .equals() to test whether two objects are equal to each other
I can use if...else statements with booleans and boolean operators to make decisions
I can simplify statements using booleans and boolean operators
I can use a while statement to execute a block of code repeatedly
I can use an iterated for loop to execute a block of code repeatedly
I can implement nested loops
I can create and implement an array to store and process data
I can create and implement an ArrayList to store and process data
I can use a for-each loop to store and process information in an array or ArrayList
I can create and implement a two-dimensional array to store and process data
I can design classes that maximize cohesion, minimize coupling, avoid side effects, and are written consistently
I can design and utilize static methods and static variables effectively
I can appropriately determine the scope of a variable and declare it in a position to reduce the possibility of accidental modification and name conflicts
I can call methods by correctly including their parameter(s) and accounting for pass by value and pass by reference conditions
I can implement a subclass and make use of inherited instance variables and methods
I can use inheritance to process objects of different types in the same program
I can create an abstract class and extend it to make subclass(es)
I can make use of and override methods of the Object class (i.e. .toString(), .equals(), instanceOf(), and .compareTo())
I can define an interface type
I can implement an interface type
I can trace a recursive method to determine the functionality of the method
I can write a recursive method to solve a given problem
I can identify and distinguish between a selection, insertion, and merge sort
I can alter sorting algorithms by changing what they sort and the order in which they sort
I can identify and distinguish between a linear and a binary search
I can alter searching algorithms by changing what they are searching for
I can compare and contrast the efficiency of sorting and searching algorithms