

AP Computer Science A

Syllabus

Instructor: Mr. Zendt

Room: A232 (Daily Lab), c113 (Zendt Classroom)

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Tutorial Hours: 3:00-4:30pm Monday/Wednesday in c133 (or a232)

Course Overview

Computer Science A is both a college-prep course for potential computer science majors and a foundation course for students planning to study in other technical fields such as engineering, physics, chemistry, and geology. The course emphasizes programming methodology, procedural abstraction, and in-depth study of algorithms, data structures, and data abstractions, as well as a detailed examination of a large case study program. Instruction includes preparation for the AP Computer Science A Exam. In teaching this course, I am to give students the programming skills to apply creative problem solving to complex problems, or even to express themselves creatively through programming.

Computer science is more than just programming. Students should leave my class with a clear understanding of Java and the ability to adapt to any new programming language that they are taught in college. I want them to have the confidence to tackle any problem-solving obstacles they encounter. I also want my students to appreciate technology and how systems on a computer work—skills that are driving the economy in the 21st Century.

Course Planner

On the following page is the sequence of the AP Computer Science A course.

TIME	TOPICS
1 week	Unit 0 – Computer Science, Computer Lab, and Jeroo
1 week	Units A, B, C – Input, Output, and Variables
1 week	Units 1 – Methods / Graphics
1 week	Units 2 and 3 – Classes, OOP, Math Operations
2 days	Unit 4 - Strings and OOP
8 days	Units 5-7 – Conditionals – If, If else, If else if, Switch Case
7 days	Units 8-9 – Iteration – For Loop and While Loop
4 days	Unit 10 - Boolean Logic and Boolean Laws <u>End of 1st 9 Weeks</u>
4 days	Unit 11 - Iteration – Nested Loops
1 day	Units 12-13 – Chopping Strings and File Input
2 weeks	Units 14-15 - One dimensional arrays
3 weeks	Unit 16 - ArrayList
4 days	Unit 17 – References / Parameters
3 days	Unit 18 - Interfaces / OOP
3 days	Unit 19 – Array of References
	<u>End of Semester One</u>
2 weeks	Unit 20 - Inheritance
2 weeks	Unit 21 - Abstract Classes
3 weeks	Unit 22 – Matrices
2 weeks	Unit 23 - Recursion
1 week	Unit 24 - Advanced Sorting and Searching / Comparable <u>End of 3th 9 Weeks</u>
2 weeks	AP Review Time
6 weeks	AP Review Time
	<u>End of Semester Two</u>

Teaching Strategies

I strive to create a learning environment that is comfortable for all students. Those who have never touched a computer should be as at ease in my class as those who have taught themselves how to program. I aim to foster critical thinking, a lifelong skill, and I accomplish this by giving challenging, yet not impossible, assignments. When new topics are introduced, I use a hands-on approach of having students see and run examples. Then they practice the new topic on their own in a short programming assignment.

Students are encouraged to share their work (especially on my more creative assignments) and will have opportunities to show their end products as well as some of their design process during presentation. This is to help foster a community of cooperation and openness in my class.

Lab Component

Programs are weaved into the teaching at varying levels of complexity. Some assignments are quick, in-class conceptual checks, which will count as homework grades. Other assignments are more complex problem-solving activities and are graded via rubric as “quizzes” and usually have an assignment length of a week with 1-2 days of class time to work on the program. Tests also feature programming components, both in the form of hand-written coding (similar to the AP Test Free Response) and 2-day unit tests: one day of programming, and one day of written exam.

Most assignments are turned in electronically via Edmodo. This allows me to quickly test student code and provide individual and private feedback to a student. Technology can have its perils, so during the first semester, students have until class begins to turn in assignments that were due the night before (such as internet trouble at home).

Programs Used in Class:

Software used in class (in order of use):

- **Jeroo:** <http://home.cc.gatech.edu/dorn/38>
- **BlueJ:** <http://www.bluej.org/index.html>
- **JCreator:** <http://www.jcreator.com/index.htm>
- **Greenfoot:** www.greenfoot.org
- **Eclipse:** <http://www.eclipse.org/>

Grades:

It will be very difficult to get an A in this class without being able to pass (get a 3) the AP exam. Please refer to the Math Department AP Contract for information about Late Work and Grading.

Homework/Classwork (10%): Most Daily Programming Assignments fall into this category.

Quizzes (15%): Written conceptual quizzes and longer, rubric-based programming assignments will fall into this category.

Tests (75%): This category includes major tests structured like AP exams, and may contain multiple choice questions and free response questions. This category also includes larger programming projects that span multiple weeks.

A note about assistance from peers: you may ask others for help on an assignment, but copying of another student's program (or small sections of) is NOT allowed and will be considered cheating/plagiarism. Changing variable names does not count as original work. Ask HOW they solved the problem, not WHAT is the solution.

AP Exam:

The Exam will be given on Thursday, May 7, 2014 at 8:00 am.

You must arrive 30 minutes early. The exam lasts 3 hours and Consists of two parts: 1 hr. 15 min. for 40 multiple choice questions and 1 hr. 45 min. for four free response.

The test is entirely pencil and paper. In other words, no computers are available. AP tests are graded on a scale of 1 to 5 with 3 considered passing. The test is difficult but is doable, with a strong emphasis on Java programming.