

Course Syllabus

Course Title: AP Computer Science A

Instructor: Mr. Brandon Petcaugh

Class Meeting Time: Daily (7 times per cycle)

Text:

Fundamentals of Java: AP Computer Science Essentials, Fourth Edition

By Kenneth A Lambert and Martin Osborne

Description:

AP[®] Computer Science A is both a 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 structured lab component comprised of a minimum of 20 hours of hands-on lab experiences integrated throughout the course. Instruction also includes specific preparation for the AP Computer Science A Exam. This course is larger in scope than learning specific programming skills. Students will gain considerable experience in complex problem solving, and in applying a broad knowledge of computers and technology to the issues facing our communities today.

Objectives:

Upon completion of this course, students will be able to...

1. Design and implement computer-based solutions to problems.
2. Use and implement commonly used algorithms and data structures.
3. Select appropriate algorithms and data structures to solve problems.
4. Code fluently in an object-oriented paradigm using the programming language Java.
5. Use the standard Java library classes from the AP Java subset delineated in Appendix A of the AP Computer Science A Course Description.
6. Recognize the ethical and social implications of computer use.

Demonstration of Learning:

The course will consist of a variety of assessment methods, including: projects, exams, and timed AP-style exams. The majority of the course has a project/lab associated with each chapter of the textbook. Those projects will make up the bulk of the student grade in the first semester. The second semester grade is split between shorter (timed) AP-style exams, and larger projects. Smaller homework assignments may be assigned frequently, but rarely factor into a student's grade.

General Course Outline:

1. Computer Hardware/Software, and the Role of Programming Languages
2. Java Virtual Machine, Bytecode, Compilers
3. Syntax, Debugging
4. Control Statements (if, if-else, while, for, break)
5. Object-Oriented Programming, Understanding Classes and Objects
6. Creating and Managing Classes and Objects
7. Strings, Advanced String Methods
8. 1D and 2D Arrays, Looping Through Arrays
9. Recursion, Sorting, Binary Search
10. AP Concept Labs: The Magpie Lab, The Elevens Lab, The Picture Lab

Additional Course Policies and Procedures:

A. Technology

This course will utilize 'BlueJ' and 'IntelliJ IDEA' as the Integrated Development Environments (IDEs) for learning Java. They are available on Windows, Mac, and Linux. Class time will be used to make sure students are downloading and using the proper software. Personal computers need to be updated, and charged, before class begins each day. Also, some sort of internet access needs to be available outside of school, at home or otherwise. Cell phones should be kept out of site, and out of mind, for the duration of the class.

B. Late Assignments and Missed Exams

In a college-level course, late assignments will not be accepted. Starting from the posted date/time of the project, students will have an additional 24 hours to submit the assignment. This 'grace period' is to allow for most circumstances, including accidentally submitting an incorrect assignment, or being absent on that particular class day. There is no credit for work submitted after that grace period.

[Further Details: If the student is absent from school on the date that an assignment is due, the assignment is still expected to be submitted digitally at the time of day designated on Schoology (whether through Schoology, or by attaching the assignment to an email). Exceptions to this rule would include: extreme medical situations, an extreme circumstance, approved field trips, and/or in the case where the student produces a doctor's note after a school absence. If this occurs, the due date will be determined on a case-by-case basis. If a student misses class for a planned field trip, whether academic or sports related, they must hand in the assignment *before* they attend the trip (extensions will not be given for planned absences). Technology issues (computer/software/printer/internet related) that produce a late assignment will not be taken into consideration. If a student misses an exam, they must make up the exam on the day that they return to class. It is up to the student to contact the instructor and find a free time to take it. Failure to do so will result in a reduced grade. Extended absences, and/or extreme circumstances, will be handled on a case-by-case basis.]

C. Group Work

On the occasion that students are asked to complete group work, each member of the group still needs to submit a full copy of the work completed. For the duration of the assignment, each student should have full access to the group's work, to avoid issues where a particular student is absent, or accidentally misplaces content. (As a side note, it is always a good idea to have your class work backed up with multiple devices or services.)

D. Academic Integrity

Cheating will not be tolerated under any circumstances, and a grade of zero will be given to all students involved. More details can be found in the 'Student Handbook.' Because programmers often take small snippets of code from the internet, this particular case will be addressed in class more thoroughly (with detailed descriptions provided in Schoology).

E. AP Policy

Students with a 'C' or lower will be removed from the course before November 15th, which is the new AP deadline for registration. See the 'Student Handbook' for more information on this policy.

F. Calculation of Course Grade

Grade	Point Range	GPA Pts AP	Description
A	94-100	5	Superior
A-	92-93	4.75	Excellent
B+	89-91	4.5	Very Good
B	86-88	4	Good
B-	84-85	3.75	Good
C+	80-83	3.5	Above Average
C	77-79	3	Average
C-	75-76	2.75	Average
D+	73-74	2.5	Below Average
D	70-72	2	Poor
F	69 and below	0	Failing