AP CSA Syllabus

AP Computer Science A (Java)
QSI Virtual School
2021-2022

Instructor Information

Instructor: Victoria Craig
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Online Office Hours: Monday-Friday, 2pm-3pm, UTC +6, Almaty, Kazakhstan
Meeting Days/Time/Location: Class platform is available 24/7 for students.
Preferred Method of Communication: Teams or Skype messages / Email

Course Description

AP Computer Science A introduces students to computer science through programming. Fundamental topics in this course include the design of solutions to problems, the use of data structures to organize large sets of data, the development and implementation of algorithms to process data and discover new information, the analysis of potential solutions, and the ethical and social implications of computing systems. The course emphasizes object-oriented programming and design using the Java programming language. AP Computer Science A is equivalent to a first-semester, college-level course in computer science.

The AP Computer Science A course requires that solutions of problems be written in the Java programming language. Because the Java programming language is extensive, with far more features than could be covered in a single introductory course, the AP Computer Science A Exam covers a subset of Java.

Students typically engage in this course in the 11th or 12th grades.

Approximate length of the course: – 33 weeks
Course Credit Equivalency: 10 QSI Credits are equivalent to 1 Carnegie credit

Course Prerequisites

Technology I
Successful completion of Geometry or higher is highly recommended

Required Materials

Course materials will be provided through our Moodle page. It will include access to several outside resources used for programming practice.

Computer with internet access
Microphone

Course Grading

QVS is a mastery learning school where students must demonstrate that they meet certain criteria ("The Student Will", or TSWs) before closing a unit and receiving credit for it. The assignments for each unit are designed to give students a chance to meet the TSW criteria for either B Level Mastery or A Level Mastery (see below). On the course Moodle page, each unit features the TSW criteria in an attached unit description PDF document.

Each unit has a rubric with "I can." statements to help students understand what they will be able to do with each TSW. B Mastery means that the student can consistently show correct application, communication, and reasoning of the TSWs. The lessons are a time to make mistakes and ask questions, the practice labs and quizzes are a way to check for misunderstandings, the College Board Personal Progress Checks are there to make sure all misunderstandings are cleared up, and the unit assessment and unit programming project are used to document final mastery. Showing that a student can take a unit assessment is not necessarily enough to document mastery because all unit assessments are a random sampling of the possible questions that could be asked for any TSW, so I will look at all of your activities to determine progress towards mastery. Below are the formative and summative assessments that I will use to make sure you are moving towards mastery and finally obtaining a unit grade.

- **Practice Problems in Lessons –** (formative) In each lesson package there is a set of practice problems at the end. This is a time for students to reflect on their own learning. In order for students to understand what they know and what they do not know, they must make note of where they need to practice more.
- **Practice Labs –** (formative) each lesson comes with several practice labs to complete while completing each lesson to hone your coding skills of each topic.
- **Lesson Quizzes and AP Progress Monitoring –** (formative) these allow me to know which students need further instruction in which areas as well as telling the student where they need more practice.
- **Unit Assessments –** (summative) Objective AP style timed assessments will be used at the end of each unit. It is my expectation that these assessments are completed from memory with use of the AP reference sheet. You are preparing to take a very comprehensive test from memory; therefore, it makes sense to practice this with each unit.
- **Unit Projects –** (summative) Programming projects are a major part of the course. Students will complete a comprehensive programming project at the end of each unit, utilizing all the skills learned and practiced during the lesson programming activities. A list of expectations/rubric will be supplied with each project.

Assignments may be graded as follows:

Attempted /NOT Completed - the student has attempted the assignment, but it is not done correctly or completely.

Completed – the assignment in question is not being used to evaluate mastery and is marked as complete.

Mastery "B" - the student has met the TSW criteria covered by the assignment for Mastery. This is sometimes also referred to as "B Level Mastery".

Above Mastery "A" - the student has exceeded the TSW criteria covered by the assignment for Mastery and meets the criteria for Above Mastery. This is sometimes referred to as "A Level Mastery" and is awarded for work that showcases a consistently sophisticated, nuanced and thorough understanding and application of the TSW criteria being evaluated.

Units may be graded as follows:

Mastery "B" - the student has met all of the required criteria (TSWs) for B Level Mastery as demonstrated in the assignments.

Above Mastery "A"- the student has met all of the required criteria for A Level Mastery described in the unit document. This typically means that a student has completed most or all assignments at "A" level.

Deficient "D"- a "D" may be assigned to the unit if the student has fallen behind (typically 10 or more days) due to lack of effort OR if the student has plagiarized material. In the event of late work, the instructor will send a reminder and if the work is still not submitted a D warning may be issued along with a prescribed schedule of when the missing work should be submitted. If the missing work is not submitted in accordance with the schedule, a D will be entered into the QVS gradebook until the work is done. In the case of plagiarism, a D will be automatically entered until the matter has been resolved. See the last page of this syllabus for more information on the plagiarism policy.

It is important to note that a "D" is not in itself a grade or a punitive measure but rather an indication that the student is not performing as required.

On Hold "H" – for whatever reason, the student is unable to complete a unit and it is put on hold until such a time as work can resume.

Teacher feedback and revision of work:
- You can expect feedback within 24 hours for work submitted from Monday-Thursday. Work submitted on Friday will receive feedback by the following Monday. QVS is open 24/7, so you can continue work over the weekend and/or during QVS breaks but cannot necessarily expect feedback if you submit work during these times.
- If a student does not receive feedback within 48 hours, the student should contact the instructor.
- The student will endeavor to revise any assignment that requires it within 48hours.

Progression through course units:
- Students must close a unit with at least a B before beginning the next (unless a unit is intended to remain open for the duration of a term or the entire year or an "H" was assigned to the unit). The teacher will work closely with students to ensure they attain B level mastery on a unit, regardless of the time it takes.
- The instructor may allow students to 'upgrade' their results on an assignment or on a unit from B to A level mastery. The ability to upgrade from B to A hinges upon the ability of the student to keep up with progression through units and therefore, upgrades to A for units and assignments may not be possible if a student is behind in the course.
- Students may only complete two (2) units in June. If a student has fallen behind during the school year, it is not possible to close more than two units between June 1st and the last day of school (typically, mid-June).

Course content

Welcome to QVS APCSA (pre-requisite for engaging in the units):
- Introductory meeting with instructor
- Enroll in AP Classroom section
- Flipgrid: Icebreaker

Essential Units (September – April):

E01 – Primitive Types: This unit introduces students to the Kava programming language and the use of classes. Providing students with a firm foundation of concepts that will be leveraged and built upon in all future units.

E02 – Using Objects: This unit introduces a new type of data: reference data. It builds on students' ability to write expressions by introducing them to the Math class methods to write expressions for generating random numbers and other more complex operations.

E03 – Boolean Expressions & if Statements: This unit focuses on selection, which is represented in a program by using conditional statements and Boolean expressions.

E04 – Iteration: This unit focuses on iteration using while and for loops as well as Boolean expressions.

E05 – Writing Classes: This unit will pull together information from all previous units to create new, user-defined reference data types in the form of classes.

E06 – Array: This unit focuses on data structures, which are used to represent collections of related data using a single variable rather than multiple variables.

E07 – ArrayList: This unit builds on unit 6 by learning how to use ArrayList objects which have a dynamic size, and methods for insertion and deletion of elements. This unit also covers privacy concerns related to storing large amounts of personal data and about what can happen if such information is compromised.

E08 – 2D Array: This unit also continues the skills learned in unit 6 regarding the storage of large amounts of related data. These same concepts will be implemented with two-dimensional (2D) arrays.

E09 – Inheritance: One of the strongest advantages of Java is the ability to categorize classes into hierarchies through inheritance. In this unit, students will learn how to recognize common attributes and behaviors that can be used in a superclass and will then create a hierarchy by writing subclasses that extend a superclass.

E10 – Recursion: In this unit, students will visit how control is passed when methods are called. They will utilize a problem-solving method called recursion, which involves solving smaller or simpler versions of the same problem rather than attempting an iterative solution.

Selective unit:

S01 - AP Review (Units 1-10 will culminate with full length AP Practice exams at the end of April/beginning of May):
- Review Notes
- Analyze Sample FRQs
- Practice Exams
- Reflection on Practice Exams

Tentative Course Schedule

Students complete all 10 units prior to taking the AP Exam. The 2022 AP CSA Exam is scheduled to be offered only paper/pencil and will occur on May 4, 2022

Unit 1 – week 1-2
Unit 2 – week 3-5
Unit 3 – week 6-8
Unit 4 – week 9-12
Unit 5 – week 13-15
Unit 6 – week 16-18
Unit 7 – week 19-21
Unit 8 – week 22-24
Unit 9 – week 25-27
Unit 10 – week 28
Selective Unit 1 - AP Test Review – week 29

Attendance Policy

5 periods per week, (equivalent of 225 minutes per week)

Students are expected to submit assignments regularly and complete each week's work before the next week begins. When assignments are submitted in bulk, feedback time increases (1 assignment graded per day).

Classroom Behavior expectations

For synchronous communication:
- School appropriate attire
- Camera on at all times
- Microphone muted on login

For asynchronous communication:
- Be polite and respectful in responses to forum posts of other students, bullying will not be tolerated.
- Remember that when you are not face-to-face, people are unable to assume mood or tone.
- All communication should be appropriate for a school setting.

Submit work on time and inform the instructor if you need an extension. Extensions will only be granted on occasion for exceptional circumstances.

Academic honesty

When working in groups, students are expected to collaborate fairly in a way that ensures that each student masters the material.

In any type of assignment, you are expected to avoid all forms of plagiarism, and use appropriate referencing to give credit to all sources that you use.

Students are responsible for being informed about what plagiarism is and how to avoid it and will be given the chance to review it in the Introduction to Online Learning (IOL) course when beginning QVS courses.

Plagiarism is a serious offense, especially in an academic environment. QVS teachers must be able to rely on the students' integrity to maintain a climate for successful learning.

You should diligently avoid any deliberate or inadvertent plagiarism. When you are unsure if the acknowledgement of sources is needed, ask your teacher.

Regardless of whether a student has intentionally or unintentionally borrowed someone else's work without acknowledging it correctly, plagiarism will be dealt with as follows:

First offense: The student must redo the assignment(s) in question. The instructor will make sure the student understands how the plagiarism came about and will give strategies to avoid it going forward. If it appears the plagiarism was intentional, parents and the director will be informed.

Second offense: The QVS director and the parent/guardian will be informed. A "D" will be assigned until the student has redone the assignment(s) in question.

Third offense: The instructor will refer the matter to the QVS director for further action.

Other Information

Students, parents, and monitors can see how students are doing in this course by checking the QVS grade book and QSI Unit Grades/Rubrics, which are updated regularly to provide an accurate picture of student progress.

Parents can contact the instructor via email (victoria-craig@qsi.org) to set up a parent-teacher conference at any point in the school year.

Students are encouraged to maintain consistent and frequent communications with the instructor to help them succeed in this course.

QVS Statement of Purpose

QSI Virtual School is a diverse international, multicultural, online learning community, offering meaningful standards-based education through mastery learning. We prepare and develop students to have confidence to pursue their dreams and to positively impact the world.

We challenge. We question. We care.