Frequently Asked Questions
Computer Science and Science
3.4.19

The Alliance for California Computing Education for Students and Schools (ACCESS), and its CSforCA project, has received numerous questions about how UC changes to A-G eligibility in science (area D) will impact computer science courses at the school level. This FAQ attempts to clarify these questions, including official language from UC Office of the President (UCOP) in blue. Any specific questions about admissions eligibility should be posed directly to UCOP (askUC@ucop.edu) as this change originates from the UC systemwide Office of Undergraduate Admissions.

Q: What is A-G?

A: A-G is the minimum eligibility requirements of the following 15 college-preparatory courses students must complete (with a letter grade of C or higher) for admission to the University of California. The 15 courses and their corresponding letter category are:

A | History (2 years)

B | English (4 years)

C | Mathematics (3 years)

D | Laboratory science (2 years)

E | Language other than English (2 years*)
*or equivalent to the 2nd level of high school instruction

F | Visual and performing arts (1 year)

G | College-preparatory elective (1 year)
(chosen from the A-F subjects above and beyond the minimum required for the A-F areas, or a course approved by the university in subject area G specifically)

Q: What are the new changes to the University of California's A-G admissions eligibility in laboratory science (area D)?

A: In the UC High School Articulation Bulletin dated February 1, 2019, UCOP issued updated laboratory science (area D) disciplines as well as course criteria that will go into effect for the 2019-2020 school year. This change means that a computer science course, *when it meets the revised area D course criteria*, and receives approval from UC High School Articulation, can count toward a recommended third or later science course in area D for UC admissions. It is important to note that this change does not automatically qualify all computer science courses to count as a science and CS is *not* a UC admissions requirement.

UC's revised course criteria for area D

UC has issued updated area D course criteria, effective for the 2019-20 school year, for high school courses to be eligible for approval in the laboratory science subject area, including allowing for online labs.

As of February 1, 2019, courses submitted to UC in the laboratory science (D) subject area for the 2019-20 school year and onwards must include a laboratory that can be classroom-based, fully online, or a hybrid. Lab activities must still be supervised by a teacher (synchronous or asynchronous, depending on the learning environment) and give students hands-on learning opportunities (i.e., lab activities that demonstrate practical/real-world applications).

For more information about area D course criteria and guidance, please see the A-G Policy Resource Guide.

Updated laboratory science (area D) disciplines

UC introduced revised science discipline options for courses submitted under the laboratory science (D) subject area. These updated science disciplines align with the Next Generation Science Standards (NGSS) for California public schools that many high schools across the state have been implementing.

Q: How can Computer Science "count" toward UC's Lab Science subject requirement?

A: UC's admissions requirement for area D is two years of college-preparatory laboratory science, including or integrating topics that provide fundamental knowledge in two of these three subjects: biology, chemistry or physics.

a. One year of approved interdisciplinary or earth and space sciences coursework can meet one year of the requirement.
b. Computer Science, Engineering, Applied Science courses can be used in area D as an additional laboratory science (i.e., third year of science and beyond).

Q: Can CS replace any science class? What is required?

A: CS does not replace the core UC admissions *requirement* of 2 years of single science or integrated science. To be eligible for UC admissions, students are still required to take two science courses covering these three subjects: biology, chemistry, or physics. A computer science course approved in area D can only count as the 3rd or 4th *recommended* year of science.

Q: When would a student need to take CS?

A: An area D-approved computer science course can count as the *third year or later recommended* science course. However, the CS course can be taken in any sequence as long as the core requirements of 2 years of science are met prior to high school graduation.

Q: Is CS a required or recommended course?

A: CS is not a requirement for UC admission. Currently there are only two required science courses selected from among these three courses: biology, chemistry, physics. But, to be more than minimally eligible (i.e., to complete more than the minimum 15 A-G subject requirements), UC recommends 3 or 4 years of science preparation, especially if students intend to major in STEM or other majors based in quantitative reasoning. This can get a little confusing because many college-bound students already know that beyond the required two years of science, taking the recommended three + years may make one more competitive for admission. For more information,
see: http://admission.universityofcalifornia.edu/freshman/requirements/a-g-requirements/index.html#lab

Q: Will any CS course count as a science course in area D?

A: Not all CS classes will count as a an area D science. In order for a computer science class to ”count” as a science, it must be aligned to the updated course criteria for area D and receive approval by UC High School Articulation.

Q: How can I get a CS course approved as an area D science course?

A: A program, teacher, or school district can submit a course description for review by UC High School Articulation. In order to update a course in the science discipline to align with revised area D course criteria, visit the A-G Policy Resource Guide for the list of disciplines and information about revising courses. In order for a course to receive A-G approval, a course must be submitted via the A-G Course Management Portal between February 1, 2019 and September 15, 2019.

Q: When does this change go into effect?

A: While the revised science disciplines were available as options to select in the A-G Course Management Portal as of this school year (2018-2019), UC has issued the updated area D course criteria effective 2019-20 for high school courses to be eligible for approval in the laboratory science subject area. Therefore, current students enrolled in high school 2018-2019 may not use a CS course approved in area D to count as their third or fourth recommended year of science.

Q: How will this change affect my school/LEA?

A: Check with your local school/district and review your school's A-G course List: https://hs-articulation.ucop.edu/agcourselist to find out how computer science courses are currently classified. Whether or not CS becomes part of the science department, the math department, is its own computer science department, or is part of another program, will be determined at the local school/district site.

Q: Can computer science still count as a G elective course?

A: Yes. The vast majority of Computer Science courses in California are currently designated as a G elective and many CS courses are part of CTE pathways. There are some advantages to maintaining CS as an elective especially as it relates to access. A G elective reinforces the notion that CS is for everyone, regardless of math or science interest and aptitude. To be UC eligible, students are required to take one college-prep elective. In this case, computer science counts as a G elective and therefore, can be considered part of the "core" requirements for UC eligibility.

Q: Can computer science count as a C math course?

A: Yes, UC recognizes a computer science course approved in area C to count toward the advanced math coursework a student may take beyond the required three years of math. But the important word here is "approved". Just like in the science category, not every CS course will count as a math course. Assembly Bill 1764 (Olson/Buchanan) in 2014-2015 allowed CS to count toward a 3rd or 4th year of math. In order for a computer science course to be approved as a C math course, it must contain substantial math content. The same process must be followed, as for a science course, by submitting a course for UC review via the A-G Course Management Portal. Currently, to become UC eligible, students are required to take three years of math; four years are recommended. For some students, getting a computer science to count as an advanced math provides further incentive for students to take it.

Q: Can one particular course count for more than one category?

A: Course submitters may choose only one subject area in which the course is considered for A-G approval. UC will approve the course if it meets the relevant subject area's course criteria.

Q: Does CS count as a math or science or elective or CTE?

A: As statewide regulations currently allow in California, a CS course could potentially count as a math, or a science, CTE and/or an elective - depending on the specific course and the category in which it was submitted to UC for A-G approval. Each LEA will make its own decision on how courses count in your specific locale.

Q: Can a computer science course also be part of a CTE pathway?

A: If the course is submitted and approved as a General Education course (math, science or elective) and is also submitted as a Career Technical Education course, it can be eligible for both college and career pathways. Some schools like to classify their CS courses in the CTE pathway because they can claim Perkins funding to support a teacher with CTE/ICT authorization.

Q: If we don't want to change how we classify our courses, do we have to change?

A: No, your local school/district has the authority to make a local decision in how you want to offer courses to your students based on the courses you choose to teach and how you report those courses to California Department of Education (CDE).

Q: What credential must a teacher have to teach CS?

A: According to Commission on Teacher Credentialing, David Crable:

"If Computer Science earns D credit as a science by UC that does not impact appropriate assignment and the credential/authorization that is required. The curriculum/content of the course determines appropriate assignment. We have not at this juncture found a computer science course that aligns with any of the science credentials we currently issue. Generally speaking, it is not necessarily the type of credit offered for a course but the actual content being taught that drives the appropriate authorization for an assignment.

Educators appropriately authorized to teach computer science courses may hold a single subject credential in Math, Business or ITE (or a CS supplementary authorization added to another single subject authorization). A CTE teacher would not be appropriately assigned for such a course unless the course itself is identified as a CTE course. LEAs should be mindful of the fact that future monitoring will be based on the CALPADS state course code that is selected for the course, so the LEA will want to make sure they select the code that most accurately reflects the actual content being taught.

The reporting for computer science courses in CDE's student data system CALPADS will be a determining factor in determining appropriate assignment next year. Computer science courses have their own course code sets now that there are content standards adopted by the State Board. Computer science courses will not be subsumed under Science as they have unique content standards. UCOP's decision to award science credit would not be a factor when it comes to determining an appropriate assignment."

Q: If a teacher holds a credential in math, science or another discipline, can credit for the class be given for one of the other categories outside of their authorization?

A: If the teacher is credentialed to teach the course content (such as computer science), then they could teach the course regardless of the C, D, or G categorization.

Q: Why did this change come about?

A: When ACCESS began advocating for computer science to "count", we were looking for ways to incentivize students to take it. Since many California districts use A-G requirements as a default high school standard for graduation, it provides a guide for students' course-taking decisions. Making computer science count toward graduation and college admissions sends a strong message about the importance of computer science and helps students prioritize computer science in their already busy load of high school coursework. And, it helps increase participation among students underrepresented in computer science, such as girls, low-income students, and students of color.

There are some advantages to maintaining CS as an elective, especially as it relates to access. A G elective course is accessible to all students, plus G elective courses reinforce the notion that CS is for everyone, regardless of math or science interest and aptitude. Although California has awarded G elective credit for most computer science courses, expanding those options to include math and science increases the advantages and incentives for students to take computer science, especially because there are so many elective options.

A report from the Computer Science Teachers Association (CSTA) and the National Research Center for College and University Admissions supports many students' experiences at the school level. It states the ability to count a computer science course as a math or science credit was the primary factor in a student's decision making with regard to taking computer science in high school. This was especially true among young women (45.1%), African American (35.1%), Latinx (34.7%), and American Indian (36.5%) students who are traditionally absent from these courses and the opportunities they provide.

Thank you to ACCESS and CSforCA, a multi-stakeholder coalition of computer science educators from Computer Science Teachers Association, CS advocates from code.org, researchers and CS professors from UC Irvine, UC Berkeley, UCLA, education advocates from Children Now, Kapor Center for Social Impact, Silicon Valley Leadership Group, industry representatives from Microsoft, Technet, and state leaders from CDE, CTC, UCOP, L Governor Newsom, and the State Board of Education for working together to increase access and equity to computer science education that is rigorous, equitable and sustainable.

This FAQ was prepared by Julie Flapan, Executive Director, Alliance for California Computing for Students and Schools (ACCESS) www.access-ca.org and email flapan@gseis.ucla.edu with special thanks to Monica Lin, University of California Office of the President.