



California Acceleration Project

Supporting California's 114 Community Colleges

To Transform Remediation to Increase Student Completion and Equity

www.AccelerationProject.org

CAP AB 705 Math Recommendations August 2018

Many who have attended CAP programs over the past year have asked for our recommendations relative to AB 705 compliance. The recommendations that follow are designed to help colleges produce the most dramatic and equitable improvements in completion of transfer-level math in light of AB 705 mandates. Below, you will also find our answers to frequently asked questions about a range of issues that arise as colleges develop their AB 705 plans to reform math placement practices and academic support for students.

- 1. Create math pathways for students by program or meta-major** so that students are placed into math most relevant to their program of study.

Transfer-intent: Typical math pathways for students with transfer-intent include Business (e.g. Applied Calculus, Finite Math), STEM (e.g. College Algebra, Precalculus, Trigonometry), Quantitative Reasoning (e.g. Math for Liberal Arts), Statistics and Elementary Teacher Education.

Career-Technical: For math intensive CTE programs develop program-specific courses that satisfy the A.A math requirement or a general "math for the trades" course, e.g. ETEC 009 for the Electrical Technology Program at Los Medanos College or Math 10 Applied Career-Technical Mathematics at College of the Redwoods. We do not recommend intermediate algebra as the terminal goal for CTE programs unless required by an outside regulatory agency.

Students in CTE associate degree programs that are not math intensive (e.g. Criminal Justice Administration or Child Development) will benefit from placement into a transfer-level liberal arts math or Statistics course, either with or without support. These courses build more useful general quantitative literacy skills and streamline the transition from CTE to related transfer programs.

- 2. Use the CCCCO default placement rules or guided placement** to give all transfer-bound students access to transfer-level math relevant to their program or major, either with or without concurrent support depending on their predicted success.

The Multiple Measures Assessment Project (MMAP) conducted AB 705-compliant placement research using statewide data and found that transfer-bound students are more likely to complete math requirements for transfer if placed directly into introductory transfer-level math. The default placements rules are based on this research and indicate that all students should be eligible for Statistics/Liberal Arts Math and students who have earned a C or better in a course equivalent to Algebra 2 should also be eligible for introductory transfer-level Business and STEM math.

Concurrent support can be provided to improve outcomes for students with lower predicted success rates. Research both inside and outside California indicates that concurrent support at the transfer-level produces dramatic improvements in transfer math completion for all demographic groups and placement levels.

When high school data is not available, AB 705 allows for guided placement. Guided placement policies should comply with the intent of AB 705 and give transfer-bound students the best chance of completing transfer-level math. Since the placement research to date has not identified any group of students who benefit from a placement below transfer-level, we therefore recommend that colleges place students without accessible high school records, including returning adults, into program-appropriate transfer-level math with required concurrent support if it is offered. All students should be informed of their Title 5 right to challenge a corequisite requirement.

3. Develop low-unit concurrent support for introductory transfer-level math courses to support students with lower predicted success.

Principles for effective concurrent support design:

- Design backwards from the transfer-level course – Concurrent support should focus on the knowledge and skills truly needed for success in the transfer-level course rather than covering the entire traditional cannon of arithmetic and algebra procedures;
- Use just-in-time remediation – Contextualize relevant skill building within the transfer-level content, as opposed to decontextualized drill that is poorly aligned with instruction in the transfer-level course;
- Use a thinking-oriented high challenge, high support pedagogy rather than concentrating solely on the demonstration and mimicry of algorithms;
- Build frequent opportunities for low stakes collaborative practice, e.g. paired problem-solving, speed-dating, poster presentations, group quizzes.
- Integrate intentional strategies, classroom policies and activities to address the affective side of learning and to create a supportive and welcoming classroom environment.

AB 705 cautions us to minimize impact of concurrent support on financial aid and unit accrual. It also limits placement into pre-transfer-level courses that lengthens time to degree. Both inside and outside of California, one- to two-unit co-requisite support courses (with one to four contact hours) have successfully supported students deemed “underprepared” in math. We do not recommend higher unit support courses that will limit students’ availability to take courses in other disciplines during the same semester they are enrolled in math and thus lengthen time to degree.

4. Shorten STEM pathways to improve completion of Calculus I. Students who have successfully completed Algebra 2/Integrated Math 3 should have access to introductory, transfer-level STEM courses (e.g. Precalculus), either with or without co-requisite support (2 units or less). Students with weaker algebra backgrounds should also have access to introductory, transfer-level STEM courses, with well-designed co-requisite support that is more intensive (e.g. 2 units with up to four additional contact hours).

Replace stand-alone College Algebra and Trigonometry courses with a single Precalculus course that integrates trigonometry. This will remove an exit point and improve completion rates of preparatory work for Calculus I.

5. Adjust the class schedule to reflect the anticipated distribution of students by meta-majors, in particular plan for many more sections of Statistics and Liberal Arts Math and few (if any) sections of pre-transfer-level math.

Frequently Asked Questions:

Can we place students into a one-year (two course) sequence that culminates in transfer-level math, such as a stretch model?

We do not recommend two-course models because they do not maximize the probability that a student will complete transfer math in one year, even if the student has a low placement assessment.

AB 705 restricts placement of students into pre-transfer math that lengthens time to degree. Pathways in which students start in non-transferable coursework (e.g. an accelerated two-semester sequence or stretch models) are AB 705 compliant if the college is able to demonstrate that the program serves students who are highly unlikely to succeed in transfer-level math and the program maximizes those students' likelihood of completion of the transfer-level math within two semesters (or three quarters). This is a high bar. An MMAP analysis of statewide data was unable to identify any group of students who would have higher completion rates if placed into pre-transfer-level math.

In general, a sequence is problematic because of inevitable attrition due in part to students who do not persist from the first course to the second even if they pass the first course. Providing concurrent support at the transfer-level produces better outcomes. For example, according to a Public Policy Institute of California (PPIC) report, in 2016 49% of students in a two-course statistics pathway at 45 California community colleges completed transfer-level math in one year, but the average transfer math completion rates in states that have transitioned to corequisite models at the transfer-level (e.g. Georgia, Indiana, Tennessee, West Virginia and Colorado) fall between 61-64%.

Another example is Statway. The one-semester Statway models yield higher completion rates of Statistics than the original two-semester model. A Statway study of five colleges that developed their own one-semester adaptations shows that completion rates ranged from 60-92%, substantially higher than the two-semester version when offered at the college and better than the 50% average completion rate for all two-semester Statway courses.

Should we keep our traditional developmental math courses as a student option?

No. We do not recommend traditional stand-alone pre-transfer-level math courses as an option for students. This recommendation comes from lessons we learned at three colleges that were early implementers of multiple measures placement differentiated by math pathway, e.g. students were given a Statistics placement and a BSTEM pathway placement (which often was pre-transfer-level.) At all three colleges, students consistently and severely underplaced themselves at high rates. For example, at Los Medanos College in Fall 2016 about 60% of students enrolled in prealgebra or prestatistics were eligible to take Statistics with support. At College of the Canyons, 95% of students eligible to take Statistics chose instead to enroll in elementary algebra or lower. These high rates of underplacement occurred despite work with counseling faculty and assessment staff around pathway advisement. Underplacement in math has dire consequences for a student's chances of completing transfer math requirements. We should not continue to offer options that produce poor outcomes.

If your college continues to offer a few sections of elementary or intermediate algebra, create barriers for students to register for those courses. Yes, you read that right; in contrast to the current system, with its barriers to transfer-level math, we recommend that colleges make it difficult for students to opt to register for pre-transfer-level classes that lower their chance of completing math milestones to degree or transfer. For example, students might have to see a counselor and also get a dean's signature before being allowed to enroll in courses below their placement advisement.

What about BSTEM-intent students who have not completed Algebra 2?

CAP recommends that all BSTEM-intent students have access to transfer-level BSTEM math, some with required support. For students who have not completed Algebra 2 or its equivalent, we recommend placement into introductory transfer-level BSTEM with no more than 2-units or four additional hours of concurrent algebra support. We do not recommend placement into a stand-alone intermediate algebra course because of the inevitable attrition in a two-course sequence that substantially lowers completion of transfer-level math. Instead, we encourage colleges to develop low unit concurrent support at the transfer-level similar to the two-hour a week lab model at Community College of Denver (for more information on the CCD model, see the CAP resource titled *Compelling Case Studies in Corequisite Support: Students Can Succeed in Transfer-level Math Without Traditional Remediation.*)

What about AA degree students that need Intermediate Algebra to complete their degree?

We do not recommend intermediate algebra for students in associate degree programs unless required by an outside regulatory agency. Title 5 allows any math course at the level of intermediate algebra to satisfy the math requirement for the associate degree and AB 705 stipulates an exception for associate degree programs “with specific requirements that are not met with transfer-level coursework;” therefore, we recommend the development of contextualized math courses for associate programs that require math intensive preparation. For associate programs that do not have specific math needs, we recommend placement into transfer-level quantitative reasoning courses (e.g. Statistics or Liberal Arts Math) that are more germane to building quantitative literacy for an educated citizenry and position the student to more easily transition into transfer preparation.

Should we also allow students to place into Calculus I?

Yes. Some colleges have always allowed students who passed Precalculus in high school with a C or better to enroll in Calculus I. Other colleges are using the original MMAP placement rules to use high school GPA and course-taking to place students into Calculus I.

What if a student fails the transfer-level course? What do we do about the fact that they only have three attempts at a course?

Students who fail can retake the course, just as they do now. We hear this question often because faculty fear that success rates will plummet under AB 705 mandates, but there is no evidence that this fear is warranted. The PPIC study *Remedial Education Reform at California’s Community Colleges: Early Evidence on Placement and Curricular Reforms* shows that transfer-level success rates “remained steady” at the four colleges in 2016 with the greatest increase in transfer math placement after multiple measures placement reform. At the two colleges with concurrent support models, “underprepared” students in concurrent support had comparable pass rates to “college ready” students enrolled in regular transfer math sections.

What should we do to support students who fail in their first attempt? More intensive math remediation is probably not the answer. In Tennessee, among students enrolled in concurrent support who failed their transfer-level math course, more than two-thirds failed every course they attempted, a pattern that suggests that more may be going on than just math readiness. As we transition into new placement and support systems under AB 705, it will be important to study and try to determine the source of students’ difficulties and develop innovative solutions, such as proactive interventions for students repeating a course.

What do we do about courses outside of math with pre-transfer-level math prerequisites?

Colleges have implemented the following strategies to deal with this issue:

- Use placement as a mechanism for satisfying prerequisites. For example, the default placement rules allow STEM majors who have completed Algebra 2 to enroll in an introductory transfer-level STEM math. This placement can clear enrollment in any science course that has an intermediate algebra prerequisite. STEM-intent students who have not completed Algebra 2 but are allowed to enroll in introductory transfer-level STEM math with support can simply wait a semester to take STEM science courses with intermediate algebra prerequisites.
- Use high school work to satisfy the prerequisite for the target course. For example, at many colleges the Chemistry course required of nursing majors has an elementary algebra prerequisite. Statewide 90-95% of community college students have completed Algebra I, or its equivalent, with a C or better. Therefore, almost all students have met the prerequisite prior to college admissions and the use of multiple measures would clear them for enrollment.
- Develop a low-unit concurrent math support course for science courses. For example, College of the Redwoods has a one-unit math review course for Chemistry.
- Include topics relevant to science or economic courses in the concurrent support for transfer math. For example, at Cuyamaca College the support course for Statistics includes “math interludes” that address math skills needed in Economics and Chemistry for general education. Students who complete Statistics support can take the GE Economics and Chemistry courses.

Can we still list a prerequisite that we no longer offer, for example an elementary algebra prerequisite for a science course?

Yes, as long as there are other easily available mechanisms for students to demonstrate readiness and gain access to the course. High school work can be used to meet the prerequisite and alternative concurrent support can be offered for those who need to develop the skills and knowledge to succeed.

Do we have to rearticulate a course if we use a corequisite to support some students?

No. A concurrent support option does not change the articulated course. A concurrent support course is an alternative mechanism for ensuring that students develop the skills and knowledge needed for success at the transfer-level, but not all students need the corequisite. Therefore, the concurrent support course should not appear as a co-requisite on the transfer-level course outline. Instead, the transfer-level course is listed as a co-requisite on the support course outline. Because no change is made to the transferable course, re-articulation is not necessary.

Will changes to placement required by AB 705 affect articulation agreements with CSU and UC?

No. The CCCCCO, CSU CO and UCOP have discussed this issue. Changes to placement required by AB 705 will not impact articulation agreements. Students may access introductory transfer-level course work through the placement process based on high school multiple measures regardless of the stated prerequisite. Students can be required to participate in concurrent support simultaneous with enrollment in the transfer-level course if there are concerns that the student needs additional support in developing the skills and knowledge to succeed in that course.

Need further guidance to maximize your college's student outcomes in math?

Email californiaaccelerationproject@gmail.com.