

UNIVERSITY SYSTEM OF GEORGIA TRANSFORMING COLLEGE MATHEMATICS JULY 2013

How to dramatically increase success rates in mathematics gateway courses
without compromising the integrity of the mathematical content

of growing recognition among labor economists that mathematical knowledge and skills are increasingly vital to an individual's upward economic and social mobility. This finding follows in part from dramatic advances in mathematics and its increasing centrality to an expanding number of academic and professional fields.⁶ A modernization of the mathematics curriculum,

campuses and small numbers of campuses within the System, cannot bring about the outcomes of Georgia's Higher Education Completion Plan to innovate at scale, and the are offered as a blueprint for this innovation

We recommend that many more students be advised to begin their programs of study in college-level, credit-bearing gateway courses. Well-prepared students should begin their study of college mathematics gateway courses. Underprepared students should also study college-level material with integrated, just-in-time support either in a single semester or over one year (see Recommendations 3 and 4).

System institutions should ensure the alignment of pathways for Area A mathematics to programs of study so that students learn the mathematical content necessary for success in their majors. There are currently two primary mathematics pathways for STEM majors, through College Algebra⁸ and Precalculus⁹ and for non-STEM majors, through Quantitative Skills and Reasoning¹⁰ or Introduction to Mathematical Modeling¹¹.

Most students in System colleges take College Algebra as their entry-level mathematics course. College Algebra was designed explicitly to meet the needs of students who are preparing to take Precalculus and Calculus. Most students in non-STEM majors would be better served by enrolling in Quantitative Skills and Reasoning or Introduction to Mathematical Modeling, possibly followed by a statistics course in Area D (Natural Science, Mathematics, and Technology) of the core curriculum. Quantitative Skills and Reasoning and Introduction to Mathematical Modeling were designed to meet the needs of STEM majors and include significant real-world applications. They are appropriate, rigorous

⁸ For College Algebra course description, see

http://www.usg.edu/academic_planning/documents/Math_1111_College_Algebra_Outline.pdf

⁹ For Precalculus course description, see

http://www.usg.edu/academic_planning/documents/Math_1113_Precalculus_acceptable_Outline.pdf

¹⁰ For Quantitative Skills and Reasoning course description see

http://www.usg.edu/academic_planning/documents/Math_1001_Quantitative_Skills_and_Reasoning_Outline_.pdf

¹¹ For Introduction to Mathematical Modeling course description see

http://www.usg.edu/academic_planning/documents/Math_1101_Introduction_to_Mathematical_Modeling_Outline.pdf

mathematics courses for a broad array of non-STEM programs of study in which deep knowledge of and facility with basic mathematics are essential to prepare students for responsible citizenship.

These two courses are currently underutilized for a number of reasons including: (1) the longstanding use of College Algebra as a barrier to entry for many selective, non-math-intensive majors

can succeed in gateway courses if they are enrolled in a link that enables them to master the key course content without falling behind important

students with major academic deficiencies in one year, co-requisite versions of gateway mathematics courses. The University of Texas, Dallas's New Mathways Project, a one-year co

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- Developing a policy on which tests should be used for placement and whether students should be required to submit SAT or ACT scores for placement purposes.

The task force recognizes that measures appropriate for recent high school graduates might not be appropriate for non-traditional students. For non-traditional students, in order to ensure that the placement index reflects current information, it might be appropriate to give relatively greater weight to a recent placement test and less weight to high school GPA.

The task force strongly recommends the elimination of the COMPASS as an exit exam.

As we shift our focus on learning support towards completion of the college-level gateway courses, the COMPASS exit exam creates an unnecessary hurdle to college completion for students who have already demonstrated proficiency by passing learning support courses. Learning support must not be a barrier that blocks students out of gateway material; it must be an integrated support system for helping students develop the skills they need to be successful in gateway courses.

Furthermore, the COMPASS exit exam is misaligned to the skills needed in the Quantitative Skills and Reasoning and Introduction to Mathematical Modeling courses. It therefore stifles innovation among institutions that want to develop alternate mathematics pathways leading to these courses.

At present, the ACMS

The University System of Georgia will seek ACMS endorsement of the corequisite strategy

An ACMS Ad Hoc Steering Committee will begin working immediately to:

- (1) Review corequisite models in Georgia and in other states to identify a small number of recommended models, including information about the number and type of credit offered, staffing, student population, and financing
- (2) Build corequisite curricular materials to provide just-in-time learning

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