

Statement on the Use of Geometry as a Pre-Requisite for General Education Math CoursesSeptember 27th, 2014

Geometry is of fundamental importance in preparing students for success in college coursework; this fact has long been recognized in Illinois. For many students, a geometry course is their first exposure to concepts of proof and deductive argumentation. The value of visualization in mathematics is also emphasized in geometry courses more strongly than in many other courses.

In the last few years, Illinois has adopted the Common Core State Standards which emphasize the integration of geometric, statistical, and algebraic approaches to mathematical modeling and problem-solving. In addition, high school graduation requirements in Illinois now require students to have at least one math course with some geometric content. These are both changes that reflect the state's ongoing commitment to the importance of geometry in the high school curriculum.

However, these changes also mean that the nature of geometry instruction in Illinois is evolving, and has been for some time. Geometry courses in high school vary widely in approach and scope, and at present many schools are moving to an integrated curriculum that encourages students to see the connections between algebra and geometry. It is therefore becoming more difficult to assess a student's high school transcript for geometry, and this poses a barrier for some students attempting to enter general education math courses.

For these reasons, the Curriculum Committee of IMACC proposes the following changes for IAI general education math courses, emphasizing geometry where appropriate and streamlining the developmental pathway where reasonable. If approved, these changes will be reflected in the 7th edition of the Articulation Guide and the corresponding IAI courses will be revised accordingly.

- To better ensure that students entering these general education courses have geometry in their background, the Preparatory Mathematics for General Education (PMGE) course will include geometry as a required component of PMGE for those schools offering this course (unless the school already has a separate geometry course as a requisite for PMGE).
- Geometry will remain as a pre-requisite that is essential for students pursuing College Algebra or the Math for Elementary Teachers sequence.
- Geometry will no longer be listed as a pre-requisite for Intermediate Algebra, recognizing that those needing geometry could take the course as a co-requisite (or potentially even after Intermediate Algebra is completed).
- Geometry as an additional pre-requisite beyond Intermediate Algebra or PMGE for certain general education math courses would be removed. Specifically, Geometry would no longer be a required pre-requisite for General Education Statistics (M1-902), General Education Mathematics (M1-904), Quantitative Literacy (M1-901, and Elementary Mathematical Modeling (M1-907) courses.

The above changes will preserve the importance of Geometry in the mathematics curriculum while also removing unnecessary obstacles for degree-seeking students. Note the above has no bearing on admissions requirements at any 4-year institution, only on the pre-requisites for the specifically listed courses.

Why not just leave Geometry as a pre-requisite for all general education courses?

- Students completing an integrated math sequence, as recommended by ISBE, will not have a geometry course on their transcript, but will have completed the intended equivalent material. Based on this, a separate geometry requirement will be in many cases unnecessary.
- At present, the vast majority of our students do meet the geometry requirement since the high school graduation requirements now include some geometry content as required for graduation.
- For most 4-year schools, the change will not impact them. Most do not currently offer a developmental geometry course, and most assume appropriate geometry background has been met through high school and the admissions process. This change would not affect their admissions procedure or native students.
- For community colleges, the change will allow the streamlining of the developmental sequence for some students to help accelerate them to degree, increase student retention, and improve degree completion rates with only marginal impact on courses offered and student preparation.
- The geometry requirement was initially added when IBHE initiated common admissions requirements for all baccalaureate and transfer associate's degrees (Public Act 86-0954). However, these requirements were *admissions* standards, not *pre-requisites*. A pre-requisite for a course should indicate foundational knowledge necessary for success in the given course—it is not clear that geometry meets this standard in terms of the general education courses listed. Students should be allowed the opportunity to prove they can be successful in these courses with an Intermediate Algebra or PMGE background.
- There is some geometric content in both of the other pre-requisites for these courses (PMGE and Intermediate Algebra). It is certainly not equivalent to that of a geometry course, but is likely sufficient for student success in these courses. Where needed, “just-in-time” review (either within the course or through independent study) can be used to ameliorate issues for students with a weaker geometry background.
- Eliminating the need to check high school transcripts for geometry (for a large number of students) will save time and money, as well as allow more rapid evaluation of placement and transfer credit, thus benefiting students.
- By delineating more clearly where geometry *is* required (for STEM-bound students, those taking College Algebra, and the Math for Elementary Teachers sequence), a clear signal of the importance of geometry and a strong mathematical background for these courses will be sent. For community colleges, this will help to more clearly define the expectations for the AA and AS degrees.
- At the most recent meeting of the IAI Mathematics General Education Panel (March 6th, 2015), there was strong support for eliminating the geometry requirement from the indicated courses.
- The Developmental Education Advisory Council (DEAC), co-chaired by Greg Budzban (SIU Math Department Chair), has endorsed this as a simple way to help students move more efficiently and directly to degree completion.
- The change has the backing of the Executive Directors of both IBHE and ICCB.
- The change is strongly supported by the Curriculum Committee of IMACC.