

July 7, 2016

Dear Colorado Mathematics and Statistics Faculty –

Please consider these recommendations from your colleagues on the Colorado Math Pathways Task Force as you revise and resubmit your mathematics and statistics (GT-MA1) courses for GT Pathways approval. The task force’s recommendations are summarized below and the full report with recommendations, as well as task force membership, can be found by clicking here:

<http://higherred.colorado.gov/Academics/MathPathways/Default.html>

1. Ensure Revised GT-MA1 Courses are Aligned with Math Pathways and the Needs of Partner Disciplines

- a) Mathematics departments should work with partner discipline departments to identify the primary mathematical competencies needed by disciplines and use these determinations to select the recommended gateway math course and pathway. This coordination between departments will serve two purposes. First, it will ensure that the gateway math course is appropriate to the content and not simply selected based on previous practice or tradition. Secondly, setting one clear recommendation, as opposed to allowing “any gateway math course,” will be clearer for students and advisors.
- b) College Algebra should be used to prepare students for success in calculus and not as a terminal mathematics course for students in majors that do not require Calculus.
- c) Consider options to help support students getting through Calculus I in their first year of study, which could include, but are not limited to:
 - Co-requisite instruction/support;
 - Stretch courses (The risk here is transferring before completing the entire course; thus, departments that opt for this model should be sure to clearly articulate the competencies achieved from each semester.);
 - Online support modules; and
 - Compressed/accelerated modules.

2. For GT-MA1 Statistics Courses in Particular

- a) A credit-bearing prerequisite should not be required for an introductory statistics course if students are college ready (that is, have GPA and/or test scores that indicate college readiness and/or have completed remedial coursework if needed, like *MAT 050: Quantitative Literacy*).
- b) The lower-division syllabi/content and names of the courses should be distinct from the upper-division courses. It should be clear to students who are required to take two statistics courses that the content in the two courses is different and that the upper-division course builds upon the foundation of the lower-division course. As an example, lower-division courses could be titled something like “Statistical Thinking” or “Introduction to Statistics” and upper-division courses could be something like “Statistical Methods for Business Majors” or “Statistical Methods for Psychology Majors”).
- c) Use the Colorado Community College System’s existing Introduction to Statistics content while also encouraging a modeling approach that provides students experiences using data and the appropriate use of technology to support data analyses.

- d) The Colorado Community College System and Colorado Mountain College should reevaluate their A.S. degree requirements to allow *MAT 135 Introduction to Statistics* to fulfill general A.S. degree requirements (Aims Community College already allows statistics to be used this way).

3. For GT-MA1 Quantitative Reasoning/Math for the Liberal Arts Courses in Particular

- a) Better consistency across institutions in key topics for this course.
- b) Include financial literacy, descriptive statistics, and the use of algebraic models and algebraic reasoning.
- c) In general, the task force encourages more depth and less breadth. The course should focus more on problem solving and quantitative reasoning with less emphasis on the appreciation of mathematics. The goal is for students who successfully complete a *Math for the Liberal Arts* type course to understand how numerical and quantitative reasoning can be used to better understand the world, and to say “I learned something I can use” in my future studies, and as a citizen.
- d) Another option for the Quant Path is an algebra-based modeling course. This course would be intended for majors that need some algebra skills but are not on a calculus path, and do not require the full content of college algebra. The algebra prerequisite should be minimal and we recommend *MAT 050 Quantitative Literacy* as the developmental education prerequisite. The Math Pathways Task Force Curriculum Working group is happy to help with this and its membership is listed here:

<http://highered.colorado.gov/Academics/Groups/contacts.asp?cid=270>

4. A Final Consideration for Future Planning of Meta-Majors and Appropriately Aligned Math Courses

- a) Meta-majors are broad academic pathways, or groups of majors with similar core requirements, that are generally aligned with a math pathway. The three recommended math pathways described above, for example, would be aligned as follows:
- CalcPath – STEM, certain health sciences, and many business programs
 - StatPath –Social & Behavioral Sciences
 - QuantPath –Arts & Humanities
- b) Meta-majors help students and advisors make initial choices with the idea that students would eventually narrow their pathway to an individual major, preferably allowing all coursework in the meta-major to transfer and apply to degree requirements of any major within the meta-major. Rather than making College Algebra the default math course, or using College Algebra as a mechanism to “weed out” students, meta-majors help advisors and students to select the appropriate math course for the career pathway, or meta-major. Please keep this in mind and work with partner disciplines as you redesign your courses.

If you have any questions about these recommendations, feel free to contact your institution’s (or system’s) representative on the Task Force – their contact information can be located here:

<http://highered.colorado.gov/Academics/Groups/contacts.asp?cid=267>

You may also contact Dr. Ian Macgillivray, Director of Academic Affairs at the Colorado Department of Higher Education at ian.macgillivray@dhe.state.co.us or 303-862-3008.