

MICHIGAN TRANSFER AGREEMENT MATH TASKFORCE
REVISED RECOMMENDATIONS FOR THE MTA MATH REQUIREMENT
January 2014

This document represents the final recommendations for the Math requirement for the Michigan Transfer Agreement (MTA). The first two pages of this document comprise the final recommendations for the three math pathways for general education —College Algebra, Statistics, and Quantitative Reasoning. The final two pages of this document provide the background on the MTA and the creation and members of the Math Taskforce. These final recommendations for the Math requirement will be embedded within the larger set of recommendations for the MTA that were finalized and submitted to the Michigan legislature last fall.

Math Pathways Revised Recommendations

College Algebra Pathway - For students proceeding to programs that specifically require background in algebra, particularly STEM programs.

Statement on Prerequisites:

- For success in the College Algebra Pathway a college level course has a prerequisite skill level of intermediate algebra or high school algebra II or equivalent content. Students will be expected to apply advanced algebra skills.
- This course must be beyond Intermediate Algebra.

Topics/content that should be a part of a course in this pathway:

- Functions, polynomials (including polynomials of degree greater than 2 and the fundamental theorem of algebra), rational functions, logarithms, exponential functions, inverse functions, and graphing by recognition and transformation rather than by plotting points. Pre-calculus topics such as sequences and series may also be included.

Descriptors to consider for this pathway:

- This course (possibly in conjunction with a separate course on trigonometry) would qualify a student to take a calculus course
- This course should be one that your mathematically capable student would start with after completing high school Algebra I and II
- This course should provide a strong foundation for critical mathematical thinking
- Many students in this pathway will have additional math courses required for their program; if a college-algebra-type course is a prerequisite for that course, students who are ready to begin with that course might be able to use it for meeting the math requirement.

Guidelines from the Mathematics Association of America:

- College Algebra provides students a college-level academic experience that emphasizes the use of algebra and functions in problem solving and modeling, provides a foundation in quantitative literacy, supplies the algebra and other mathematics needed in partner disciplines, and helps meet quantitative needs in, and outside of, academia. Students address problems presented as real world situations by creating and interpreting mathematical models. Solutions to the problems are formulated, validated, and analyzed using mental, paper and pencil, algebraic, and technology-based techniques as appropriate.
- Link: <http://www.maa.org/sites/default/files/pdf/CUPM/crafty/CRAFTY-Coll-Alg-Guidelines.pdf>

Statistics Pathway - For students proceeding to programs in business or social sciences.

Statement on Prerequisites:

- The Statistics Pathway will satisfy the MTA requirements for general education.
- For success in the Statistics Pathway a college level course has a prerequisite skill level of at least beginning algebra or high school algebra I or equivalent content. Students will be expected to apply basic algebra skills.

Topics/content that should be a part of a course in this pathway:

- Probability, descriptive statistics, and inferential statistics, including hypothesis testing, p-values, confidence intervals, and linear regression. The course should incorporate both formula-based and technology-based approaches to statistics.

Descriptors to consider for this pathway:

- This course must go beyond descriptive statistics
- The course can be algebra-based or calculus-based
- The course must be taught and organized by the Math (or Statistics) department or be cross-listed as a Math (or Statistics) course
- The course should be conceptually driven from a Math perspective

Guidelines from the American Statistical Association:

- The best thinking about introductory statistics courses is that students should focus on statistical thinking. The Guidelines list goals of the statistics course, which form the minimum expectations for an MTA statistics course.
- Link: http://www.amstat.org/education/gaise/GAISECollege_Goals.pdf

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Quantitative Reasoning Pathway - For students proceeding to programs not requiring statistics or calculus.

Statement on Prerequisites:

- The Quantitative Reasoning Pathway will satisfy the MTA requirements for general education.
- For success in the Quantitative Reasoning Pathway a college level course has a prerequisite skill level of at least beginning algebra or high school algebra I or equivalent content. Students will be expected to apply basic algebra skills.

Topics/content that should be a part of a course in this pathway:

- Mathematical modeling and the use of reasoning to choose between competing models
- Numeric, symbolic, and graphical methods to handle a variety of applications
- Topics could include but are not limited to number sense and estimation, linear and non-linear models, financial models, symbolic logic, networks and graphs, probability and counting, statistical reasoning, voting theory, geometric models, similarity and scaling, and game theory

Descriptors to consider for this pathway:

- Building on the Kentucky guidelines articulated below, this course should help students communicate mathematical and/or statistical information symbolically, visually, and/or numerically.
- This course should also help students communicate a quantitative argument in writing.

Guidelines borrowed from the Kentucky Council on Postsecondary Education:

- The General Education Transfer Policy and Implementation Guidelines for Quantitative Reasoning (page 11):
 - ✓ Interpret information presented in mathematical and/or statistical forms.
 - ✓ Illustrate and communicate mathematical and/or statistical information symbolically, visually, and/or numerically.
 - ✓ Determine when computations are needed and to execute the appropriate computations.
 - ✓ Apply an appropriate model to the problem to be solved
 - ✓ Make inferences, evaluate assumptions, and assess limitations in estimation modeling and/or statistical analysis.
- Link: http://cpe.ky.gov/ISR/rdonlyres/6D7A8159-16D3-4810-A0B6-3D8161157D73/0/Revised_GE_Transfer_PolicyImp_Guidelines.pdf