Guidelines for Courses Proposed for the Mathematics General Education Distribution

Approved by the University of Massachusetts Faculty Council, May 6, 2024

Motion 4: That the following guidelines be approved for the Mathematics Distribution:

The general statement on and criteria for the General Education Mathematics Distribution are as follows:

Courses in Mathematics will present methods, principles and patterns of thought that are used to study mathematical and logical systems. Students will gain some insight into how the aesthetics of mathematical analysis and its practical uses extend our understanding of human thought and the real world in which we function.

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Criteria for General Education Distribution Courses in Mathematics/Technology (courses in this Distribution area should meet either the Mathematics or the Technology criteria specified below):

A. Mathematics

A significant part of the course should be aimed at the mastery and/or application of mathematical principles (i.e., doing mathematics).

The course should promote mathematical thinking and inquiry. To this end, the course should regularly require students to explain their reasoning and apply mathematical principles. Students should also be asked to make conjectures and explore and analyze mathematical problems.

The course should foster an appreciation of the value of mathematics, whether it be practical, aesthetic, or intellectual. ("DISTRIBUTION AREA DESCRIPTIONS AND CRITERIA FOR COURSE CONTENT IN DISTRIBUTION COURSES [Revised 2006]. https://www.umb.edu/media/umassboston/content-assets/academics/pdf/TanDocumentCASDistributionGuidelinesUpdated2006.pdf

The General Education Mathematics Distribution will be given for courses of three or more credits in which college-level mathematics is predominant. "Predominant" is specified here as two thirds of the content of a three-hour course. "Content" is meant to be understood, on the one hand, as texts and concepts, and on the other, as exercises and formative and summative assessments. This guideline would hold for courses proposed by the Mathematics Department and by other Departments. The current (2017) Massachusetts Curriculum Framework for K-12 Mathematics (https://www.doe.mass.edu/frameworks/math/2017-06.pdf) would serve as a reference for determining the scope of pre-college mathematics. The determination of college-level mathematics for particular courses proposed for the distribution would depend on the specific mathematics of the individual course proposed. Regardless of the mathematical focus, the course would provide training in and opportunities for both calculation and reasoning, "mathematical thinking and inquiry."

College-level mathematics builds on the foundation of pre-college mathematics. The two thirds figure allows all or part of the remaining one third of the course to be devoted to that foundation. All or part of the remaining one third might also be devoted to focused study of the non-mathematical content to which the mathematics is applied, such as in the Natural and Social Sciences.

Developers of proposals in general and applied statistics may wish to consult the American Statistical Association's 2016 "Guidelines for Assessment and Instruction in Statistics [GAISE] and its 2020 "Pre-K–12 Guidelines for Assessment and Instruction in Statistics Education" [GAISE II]. https://www.amstat.org/education/guidelines-for-assessment-and-instruction-in-statistics-education-(gaise)-reports Proposal developers may also wish to consult the Advanced Placement course descriptions for statistics and other areas of mathematics of illustrative lists of college first-year mathematical concepts: https://apstudents.collegeboard.org/course-index-page

https://www.umb.edu/media/umassboston/editor-uploads/faculty-council/2024-05-06-FC-Minutes.pdf