



Math That Matters: Math for the Modern World

The Virginia Military Institute's (VMI) QEP, ***Math That Matters: Math for the Modern World***, aims to enhance students' cognitive outcomes for and affective orientations toward "***math that matters***" for all walks of life by leveraging research from the learning sciences broadly and mathematics education specifically, as well as instructional innovations like the high-impact practices.

Math that Matters will implement a series of interventions for students and/or faculty (both applied math and non-math faculty) in order to improve students' learning in VMI's core curriculum math sequence to achieve the following goals:

Goal 1	To ensure non-STEM students are better able to use mathematical/computational skills to solve a wide variety of disciplinary and interdisciplinary problems.
Goal 2	To promote non-STEM students' affective development and attitudinal shifts toward math coursework to improve learning.
Goal 3	To foster an exciting and supportive collaborative environment for the learning of mathematical/computational skills for non-STEM students.
Goal 4	To promote a broader awareness of the applicability of mathematical/computational skills in all disciplines and professions.

The interventions encapsulated by ***Math that Matters*** drill down first to address a large, structural issue, then proceed to make course-based curricular changes, and finally hone in on fine-grained instructional enhancements at the faculty level. This approach is driven in large part by lessons learned from VMI's first QEP, which focused on structural and some curricular-level changes for general education, which may best be described *as necessary, but insufficient* for the kind of student learning outcomes desired of the program. The tripartite approach taken by ***Math that Matters*** is designed to address this shortcoming of the previous QEP's implementation.

- **Structural Change.** VMI will combine the two existing core math sequences for non-STEM majors into a single two course sequence (MA 101/102) containing the most relevant skills from both, while adding a set of modern computational skills, a comprehensive assessment structure, and a reduced classroom size.
- **Curricular Change.** The new course will consist of modules that are informed by cadet perspectives, best pedagogical practices, and interdisciplinary problems shaped by faculty from other departments. The modular design is intended to increase cadet interest, ownership, and mastery of skills by learning a framework for solving problems in the context of their own academic and professional interests.
- **Pedagogical Change.** Course Faculty will establish a cadet-centered educational environment that enhances learning outcomes and knowledge retention, while preserving classroom faculty's sense of authorship and ownership for their classes.

Success of this QEP is measured through success on the Mathematical Inquiry Student Learning Outcomes (cognitive learning outcomes), through improved academic motivation on the [MUSIC Model Inventory](#), and through effective faculty training. This training is both for the applied mathematics instructors and for the broader faculty members across campus who are involved in all aspects, from authorship to revision of the modules, management of the summer institute, and grading of the final poster session.

In summary, ***Math that Matters*** was the product of an Institute-wide topic search, is designed to solve math-related student learning outcomes, and enjoys the broad backing of our faculty, cadets, staff, and Board of Visitors. We believe that this QEP will produce better learners, better problem-solvers, and better teachers, capable of shaping positive outcomes in a modern world.