Quantitative reasoning requirement

Students in quantitative reasoning courses will acquire introductory mathematical concepts and skills that are necessary for everyday life and to successfully complete their chosen field of study. In quantitative reasoning courses students will gain an awareness of the utility of mathematics in life and an appreciation of the scope and nature of its decision making potential. These skills include critical thinking, mathematical reasoning, the use of technological tools, computation, interpretation, inquiry, and application of mathematical concepts to issues and problems in the contemporary world.

Learning Outcomes:
Students will be able to:
1. Recognize, explain, and use the tools of thinking critically to:
   - Pose relevant questions about quantitative analyses
   - Explain the difference between inductive and deductive reasoning.
2. Apply appropriate and correct numerical computation and technology to decision making.
3. Apply techniques for estimation with correct units of measurement identified.
4. Identify and select, in problem solving, the appropriate quantitative method and strategy, and apply appropriate algebraic or statistical analysis.
5. Describe the power of, and use appropriately, deterministic or stochastic function models and
   - Use technology to construct and interpret graphs of these functions, and
   - Explain the limitations of the graphs.
6. Organize, analyze, interpret and present data in appropriate and effective ways using
   - Verbal and written methods,
   - Correct notation and symbols,
   - Algebraic or probabilistic/statistical methods and
   - Technological tools.
7. Demonstrate an appreciation for the varied applications of quantitative reasoning in areas not traditionally viewed as quantitative fields.

Students who successfully demonstrate the above learning outcomes will have made at least an introductory demonstration of the following general education goals as listed in the Guidelines and Criteria for General Education at USM:
- Employ quantitative and qualitative analyses to solve problems, identify the component parts of complex issues and describe their interrelationships, and evaluate information using accepted criteria and standards.
- Recognize and construct well-reasoned arguments
- Have knowledge of the intellectual standards and criteria for sound reasoning and logical argumentation
- Express themselves clearly through a variety of media including writing, speaking, non-verbal modes, and technologies
- Critically read and frame questions for understanding
- Value and appreciate the richness of multiple literacies and forms of expression, and the limitations of each in contributing to knowledge and understanding.
- Have knowledge of the standards and criteria of effective communication and critical reading and,
- Have knowledge of artistic, scientific, quantitative, linguistic, technological, philosophical, and socio-cultural literacies.

**Course Characteristics:**
1. All quantitative reasoning courses should involve active and collaborative learning such as a lab or other hands-on learning component.
2. Course enrollments are limited to 30
3. Course Prerequisites: Students must meet existing proficiency requirements prior to enrollment.
4. Course restrictions: Students must complete their quantitative reasoning component prior to enrollment in a Science Exploration course.