

Alignment Between the University General Education Policy and Student Learning Outcomes Assessment Goals and Objectives

B. Natural Sciences Breadth Area

<p>B.1. Mathematics</p> <p style="margin-left: 40px;">Courses: Mathematics 110 (4 units) Mathematics 115 (4 units) Mathematics 120 (4 units) Mathematics 192 (4 units) Mathematics 211 (4 units)</p>	
<p>GE Policy</p> <p>After successfully completing the mathematics component of the general education program, the students should have acquired substantive skills in quantitative and abstract reasoning in the use of mathematics as a computational and analytical tool. These skills are important for an individual to function as an effective member of a technology society. They are essential skills for success in other course work in the natural sciences. The quantitative and abstract reasoning skills will be helpful throughout the entire general education program.</p> <p>a. <u>Beginning Skills</u>. The student is required to demonstrate competency in beginning mathematics skills by obtaining a passing score on the Entry Level Mathematics (ELM) exam. Failure to take this exam within two quarters of admission will lead to administrative probation, which may lead to disqualification from future attendance. This exam assess competency in the beginning skills of:</p> <p style="margin-left: 20px;">I Arithmetic; II elementary algebra; III elementary geometry.</p>	<p>Outcomes Assessment Learning Goals</p> <p>Upon Completion of this requirement students will be able to:</p> <p>Goal 1: Understand basic mathematical concepts and quantitative reasoning. Objectives:</p> <ol style="list-style-type: none"> 1. Solve problems by applying algebraic, geometric, or analytic concepts appropriate to the mathematics basic skills course completed. 2. Translate verbal statements to and from mathematical expressions. <p>Goal 2: Demonstrate a critical understanding of mathematics. Objectives:</p> <ol style="list-style-type: none"> 3. Critically evaluate quantitative information, and identify deceptive or erroneous information. <p>Goal 3: Apply mathematics. Objectives:</p> <ol style="list-style-type: none"> 1. Effectively organize, summarize, and present information in quantitative forms such as tables, graphs, and formulas.

Appropriate pre-collegiate remedial mathematics courses or tutorial-type assistance programs are available for students failing this exam. Such remedial course work does not satisfy a general education requirement.

b. Intermediate Skills. Students are expected to demonstrate knowledge of intermediate skills in mathematics by obtaining a suitable score on a placement test administered by the Department of Mathematics. To obtain a suitable score, the student must demonstrate competency in:

- I. solving linear and quadratic equations;
- II. solving linear and quadratic inequalities;
- III. using algebraic fractions and rational equations;
- IV. using exponents, radicals and radical equations; and
- V. applying the above concepts to solving word problems.

Appropriate pre-collegiate remedial mathematics courses or tutorial-type assistance programs are available for students failing this exam. Such remedial course work does not satisfy a general education requirement.

c. College Skills. To satisfy the general education requirement for the acquisition of college skills in mathematics, the student completes a course listed in the Mathematics Section of the Natural Sciences Breadth Area. Such courses shall assume mastery of and build upon the beginning and intermediate skills that are acquired as a part of a pre-collegiate preparation or remedial

2. Use numerical, graphical, and symbolic information to support or criticize arguments and draw valid conclusions.

Goal 4: Make connections between mathematics and other disciplines through the use of mathematical models.

Objectives:

3. Identify examples of mathematical models from a variety of quantitative and non-quantitative disciplines.
4. Demonstrate ability to construct mathematical models in the context of other disciplines

instruction. Based on the student's interests, academic goals, and score on a placement exam, four options are available for instruction in college-level skills in mathematics:

- I. Ideas of Mathematics. The objectives of a course in this option are to acquaint the nonspecialist with areas of mathematics which illustrate interesting applications and to develop quantitative reasoning skills. Topics will be chosen from finite or discrete mathematics.
- II. Introduction to College Mathematics. The goals of a course in this option are to sharpen mathematical skills introduced in high school, introduce more advanced topics, and provide applications. Topics will be chosen from college algebra.
- III. Advanced College Algebra and Analytical Geometry. The goals of courses in this option are to sharpen mathematical skills introduced in high school, introduce more advanced topics, and provide applications. Topics will be chosen from advanced college algebra, analytic geometry, and trigonometry.
- IV. Calculus. Here the close connection between algebra and geometry is studied from an analytic point of view