# **GE Area 2 Assessment**

**Semester:** Spring 2018

**GELO:** Conduct calculations and solve problems using quantitative reasoning (ILO 2.7)

Method of assessment: Analysis of activities across multiple semesters in BIO 105, 219, MATH 106, 108, 115, 120, CHEM 110, 120, 121, PHYS 120, 121, 140, and topographical map exams in Geology/Earth Science

**Criteria:** Students will achieve an average of 65% on assignments and exams

**Results**

The cumulative average across multiple courses and semesters was 69%, which exceeds the criteria for the general education area outcome. Data and reflections show students demonstrated strong understanding in exponential equations, matrixes, solving trigonometry equations, triangles, and applications with differentiation and integrations. They showed a consistent ability to plug numbers into a formula in chemistry and physics courses, and perform repeated calculations in physics. Students increased their knowledge of PLS systems, contouring, and vertical exaggeration in geology/earth science. Students showed improved success in CHEM 120 if they had taken BIO 120 first.

Instructors across disciplines reported that students demonstrated difficulty with fractions, proofs, solving equations backwards, rearranging equations, pattern recognition skills, complex conversions, translating word problems into math problems and symbolic calculations. Students also showed deficiencies when applying math to mapping problems in geology/earth science. Instructors attributed some of their challenges to the lack of transfer level math pre-requisites for science courses. Real-life applications create a gap in ability for students without a calculus background. Students seem to expect science teachers to teach math. Instructors predict students with a Math 106 background and above are more successful in science classes.

Faculty expressed a desire for further dialogues and collaborations between the math and the sciences. Students would benefit from math workshops on specific topics related to chemistry, biology, and physics. A science liaison in the Math Success Center might also improve success, in addition to visits from science faculty in math classes to let students know expectations. Future math co-requisite development should involve discussion about what skills are needed for the sciences. Faculty also considered creating a biology specific co-requisite course and an applied math class.

Faculty are seeking funds to develop the mastery platform and tailor it to NVC, as well as create online modules in math that can be used as supplements in science courses. Collaboration is needed to determine the most important topics across disciplines and design related modules and quizzes. Supplemental instruction in math is most effective when taught by math instructors, but staff is limited. Departments identified the need for professional development in common core math needed so students and teachers are using similar terms.