

## Objective Review Committee Report

### Objective 3: Mathematical ways of knowing – Spring 2019

Committee membership: Paul Cady, Michael Matussek, Randy Norton, Teri Peterson, James S. Wolper.

#### **Included in the Review**

MGT 2216 – Business statistics

MATH 1123 – Math in modern society

Math 1127 – The language of mathematics

Math 1120 – Finite mathematics

Math 1153 – Statistical Reasoning

Math 1160 – Survey of Calculus

Math 1170 – Calculus I

MATH 2256 – Structure of arithmetic for elementary school teachers

MATH 2257 – Structure of geometry and probability for elementary school teachers

TGE 1140 - Survey of applied mathematics

RCET 1372 – Calculus for advanced electronics

#### **Not included in the review:**

MATH 1143 – College Algebra

MATH 1147 – College Algebra and Trigonometry

*A. Evaluate the assessment plan for each course, together with its implementation. Provide a brief summary of the Committee's findings in this area. Describe any recommended changes.*

Approved plans are in place for all the courses that were evaluated. MATH 1143 and MATH 1147 were recently approved as meeting the general education requirements for math. Since these courses were not previously included in Objective 3, they were not included in this review. The department has indicated that they will be subject to the same methods of evaluation as the other general education courses within the department.

Specific recommendations for improvement were already developed by the departments responsible for Math and TGE courses. We agree with these plans. Improving communication with faculty responsible for the assessments appears to be a common goal in both MATH and TGE course assessment. TGE proposed to change the membership of the review committee, develop a more robust scoring system, and communicate expectations to course instructors. The department covering the MATH courses will clarify the assessment process to course instructors. RCET-1272 and MGMT-2216 do not require changes. The assessment processes for RCET-1372 and

MGT-2216 were fully implemented and evaluated. Led by the ongoing assessment data, both assessment plans are being adjusted to improve the process.

*B. Evaluate the assessment outcome for each course. To what extent are students in each course satisfactorily achieving the learning outcomes for the objective? Provide a brief summary of the Committee's findings in this area. Describe any recommended changes.*

The current approach for assessing the general education objectives was implemented two years ago. The current report includes the first two years of the assessment process. Both MATH and TGE both have experienced difficulties with the implementation of their assessment plans. The lack of faculty participation and understanding of the process has led to difficulties in interpreting the results. It is noteworthy that participation and compliance have improved from the first year. At this point, there are only two years of data collected. This minimal amount of data makes a full evaluation of the outcomes difficult. The data that is available has been used by the departments. TGE has identified issues that individual instructors will address.

The reports from the courses MTG-2216 and RCET indicate that the performance of their students met objectives. The faculty for the respective courses reviewed the results and have adjusted their courses. The Department of Math has experienced difficulty in gathering the anticipated data. They had a multi-year plan for evaluating different outcomes. It appears that only a few course instructors understood the plan which led to insufficient data gathered on several of the outcomes they were assessing.

The lack of data, due to poor participation and lack of understanding does not permit the full evaluation for the success of these courses, except for MGMT 2216 and RCET-1372. The other departments have plans to improve participation and gather sufficient data for a more comprehensive evaluation. We support their recommendations.

*C. Evaluate the list of courses currently approved to satisfy the objective. To what extent does the current list contribute to a strong, coherent system of general education. Would a reduction or increase in the number or variety of courses in this objective strengthen the overall system? Provide a brief summary of the Committee's findings. Describe any recommended changes.*

The committee believes these courses meet the requirements of the general education program at Idaho State University. Two courses were recently added to this list, specifically MATH 143 (College Algebra) and MATH 147 (College Algebra and Trigonometry). These were added to meet the requirements of the State Board of Education. At this time, the committee does not recommend any additions or deletions from the course list.

*D. Evaluate the stated learning outcomes of this general education objective. Are there any problems with the learning outcomes as currently described, or ways in which they*

*might be improved? Provide a brief summary of the Committee's findings in this area. Describe any recommended changes.*

The committee concurs with the Department of Mathematics and Statistics regarding the current objectives. The current objectives are not consistent with objectives that provide clearly measurable outcomes. They appear to be written as a goal instead of an objective. While there is not an objection to these as goals, they do not support appropriate assessment. Well written objectives would likely lead to a more effective and cohesive assessment of the general education curriculum.

The committee believes that the development of clear, concise, measurable objectives is essential for the effective assessment of Objective 3. The current system has made the process difficult for course instructors to understand and has led to data that does not produce the information needed to drive the improvement process. We strongly recommend that changes be made to the system.

*E. Evaluate the objective itself and its place within the system of general education. To what extent does the objective, in its current form, contribute to a strong overall system of general education? Are there ways in which the objective could be modified to improve it? Could the system be improved with its elimination or replacement? Provide a brief summary of the Committee's findings in this area. Describe any recommended changes.*

The committee fully supports the inclusion of Objective 3 (mathematical ways of knowing) in the general education curriculum. It is a vital and essential component of contemporary education. The current intellectual climate is quantitative and algorithmic; the ability to work effectively with "mathematical ways of knowing" is vital to success in every field as well as to good citizenship.