

  
**MEMORANDUM****MARCH 18, 2021**

**TO:** BRIAN WISSMAN, CHAIR OF MATHEMATICS  
JAMES MIKE, DEAN OF NHS  
BONNIE IRWIN, CHANCELLOR  
KRIS RONEY, VICE CHANCELLOR OF ACADEMIC AFFAIRS

**FROM:** SERI UJANGPAINITH, ACREDITATION LIAISON OFFICER  


**SUBJECT:** REVIEW OF THE 2020-2021 MATH SELF STUDY

**CC:** ACADEMIC PROGRAM REVIEW ADVISORY COMMITTEE

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This memorandum constitutes the evaluation of the document submitted February of 2021 as evidence of program rigor, integrity, and quality of instruction and operations in the Department of Mathematics, College of Natural and Health Sciences, University of Hawai'i at Hilo.

**I. 2012-2013 Self-Study**

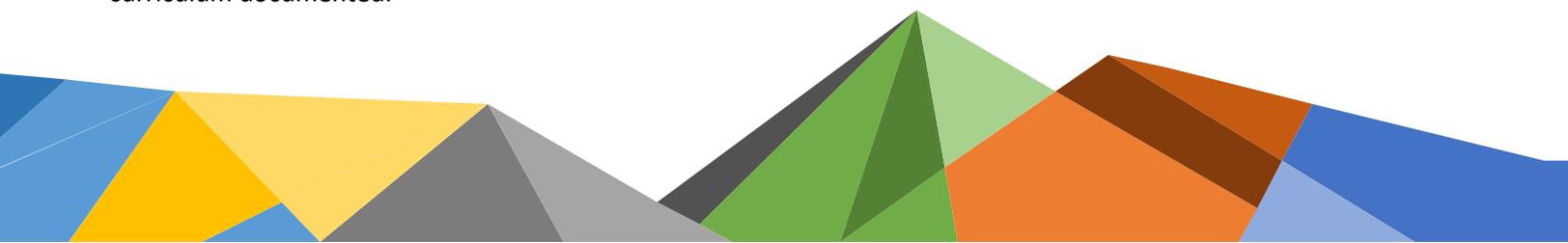
The Mathematics Department was last reviewed in Spring of 2013. The self-study at that time cited a growing culture of program-based (discipline-specific) assessment by which “department [wa]s striving to make assessment a more intuitive part of our work, an effort in which the department [had been] attempting to involve a higher percentage of the faculty, and to encourage more discussion of how well we are meeting our mission” (p. 22). This was being done through the insertion of student work that was tied to SLOs into existing course exams.

At this time, the Department also noted that “quality of writing appears to have dropped over the past 10 years and an assessment was performed to verify. Some of the instructors in Math 205 and 206 have introduced short writing assignments with very specific learning objectives. Over the course of a single semester, the quality of writing appears to have notably improved. Future assessment efforts will assess these results more closely” (p. 23). This reflects the Department’s recognition that institution-wide core competencies—i.e. Written Communication—which are mandated by WSCUC was also a primary concern.

**II. 2020-2021 Self-Study**

In the seven years since the last review, the Department appears to have made major strides in program-specific assessment.

The Math Department now regularly engages in discipline- and program-specific assessment as documented on pages 35 through 40 of the self-study, with assessments mapped to SLOs and improvements made to courses and/or curriculum documented.



In particular, the Department has been exceptional in using assessment data to “close-the-loop” on curriculum. One example is Calculus I and II (MATH 241 and 242), for which “summative assessment of . . . lab concepts” was missing. For Calculus I and II, the instructor “added several quizzes spaced throughout the semester to check whether students were retaining the material previously covered. These were not intended as high-stakes assessments; instead, they were a chance for students to review the material. At first these quizzes were on paper, and the students would copy their answer from CoCalc to the page. Now these quizzes are also completed in CoCalc.” This in turn led to adjustments in pacing. (p. 9)

In Appendix C, the Department further submitted as evidence data for the assessment of MATH 103, which is a pre-requisite for MATH 125 and MATH 135, courses that are required by other degrees. This assessment was geared towards analyzing the efficacy of this “gateway” course; 60% of the students enrolled in this course (4 sections) took the exam ( $n = 38$ ), with the Mean, Median, and Mode calculated at “8.2, 8 and 10 respectively.” What is commendable about this exercise is that the Department was quick to note limitations of the data: “The results are inconclusive about the remaining enrolled students, 24 of 62 (39%), who were not in class to take the assessment. [ . . . ] This assessment [also] does not address the success of these students as they progress into higher level classes. This level of honest self-reflection, including an awareness of the possible limitations of assessment data and what it signifies is what all programs should strive for—that all attempts at gauging student learning may not always produce actionable data.

Thus the Department is to be congratulated for this advanced level of student-learning assessment and the direct relation such activities are used to chart the progression of students through four years of the degree. The fact that assessments are also worded throughout the self-study and that multiple individuals, including tenure track, instructors (non-tenured), and lecturers (part-time adjuncts), and were assigned different levels of assessment shows that this practice is highly integrated into the functioning of the overall program. This ensures that all members of the faculty are engaged in maintaining standards of learning and have direct input into “closing-the-loop.”

The only weakness is the lack of follow-up from the 2012-2013 self-study that started to look closely at writing as a necessary skill for math majors. Core competency assessment is based on a generic rubric that may not give enough information on the level of skills specifically needed by 4<sup>th</sup> year math students; the two genres submitted for core competency assessment—a lesson plan in [2013-2014](#) and a typed presentation in [2018-2019](#)—may be too discrete to provide meaningful information for the Department.

### **III. Recommendations**

Based on the observations above, the ALO offers only one recommendation, that the Department look to meaningfully constructing descriptors of what minimally competent skills in oral communication, written communication, information literacy, and diversity mean for the degree in mathematics.

One example is the 2017-2018 written communication assessment cites math students must “articulate mathematically related materials.” This could present a prime opportunity to better define what competent articulation of a mathematical theorem looks like as opposed to one which clearly is below standards. Creating concrete descriptors can then be used by the department to demonstrate to potential employers (i.e. Hawai'i State DOE) what specific skills APART from mathematics content knowledge math graduates possess.