

# Mathematics Program

## School of Arts & Science, University of Alaska Southeast

### 2012-13 Annual Report on Assessment of Student Learning Outcomes

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**Goals/Objectives:** The goals/objectives and methods of assessment for the Mathematics program in general, and the major and minor specifically are detailed in the revised (May 8, 2013) *Mathematics Program Assessment Plan*, posted on the Provost's website.

**Data Collection and Analysis:** Institutional data was unavailable for this annual report. Findings for this report are based on observations made in the Mathematics Senior Seminar or other relevant courses, on observed course enrollment figures in QMENU, and by way of *ongoing yearlong discussions* among, and feedback from program faculty at the three campuses.

**Key Findings and Measures (2012-13):** A few program actions mentioned in the 2011-2012 report are ongoing.

- The current status of mathematics majors is shown below. Note that many students listed as "Left UAS or Unknown Status" in the last Annual Report have been removed from this updated table.

	New	Total	Making Progress	Left UAS or Unknown Status	Graduating AY 2013
# of Majors	3	29	18	11	2

- Eric Keller became the second UAS mathematics major to present his capstone project, "*Mathematical Resilience in Biology*," at a regional mathematics meeting (PNW MAA 2013 in Salem, OR). This, combined with excellent presentations from other mathematics majors, is a continued indication that the capstone assessment process is producing the desired results. Eric was also declared the "*Outstanding Mathematics Student*" by the mathematics faculty, and was the first recipient of the "*Ron Seater Mathematics Award*" in Fall 2012.
- Enrollment figures for the new course MATH 106: *Concepts and Contemporary Applications of Mathematics* were as follows. After the withdraw date Juneau had 5 students for the Fall semester, and for the Spring semester Juneau had 11 and Sitka had 7 students.
- STAT 107: *Survey of Statistics* is no longer to be offered locally at the Juneau Campus. As of Spring 2013, this course is to be offered only through distance delivery; currently only through the Sitka campus. The rationale for this change was to increase average enrollments; the local Juneau campus course typically had very low enrollments for a lower-division course. Spring 2013 enrollments (for Sitka) after the withdraw date were 17.
- Enrollments in MATH S205/206 during the 2013 academic year were 7 and 14, respectively. To date, no complaints about the courses have been received by the mathematics program. This course continues to be taught by an Education faculty member.

- After the withdraw date, enrollments for Juneau Campus Summer 2012 lower-level mathematics courses ended up being: 7 for MATH 055; 5 for MATH 105; and 10 for MATH 108. Sitka distance courses had reasonably high enrollments.
- Average enrollments after the withdraw date for other lower-level math/stat courses for the Fall 2012 and Spring 2013 semesters at the three Campuses are given below. Sitka enrollment figures do not include courses taught at the Petersburg and Wrangell high schools.

		MATH 054	MATH 055	MATH 105	MATH 107	MATH 108	STAT 107	STAT 273
Fall Average	J	42	20	22	18	25	-	19
	K	10	11	17	7	-	-	13
	T	18	27	26	14	-	10	-
Spring Average	J	12	16	21	19	17	-	16
	K	-	11	19	7	-	-	6
	T	16	34	7	14	-	17	25
AY Ave.	J	27	18	21	19	21	-	18
	K	10	11	18	7	-	-	11
	T	17	31	20	14	-	14	25

- The Summer *Math Refresher for New Students* course was once again offered in Summer 2012. A summary of findings to date is given below.

For 2011, four students took the Math Refresher. Only one was appropriately eligible for the refresher. He placed into 105 after the refresher and made an A in 105 and an A in 107 in the subsequent 2 semesters. The other 3 students placed in 055 and have yet to pass it at any UA campus (during the past four semesters). In 2012, 10 students completed the Math Refresher. Three of them placed into 105 after the camp. Two of those took and passed Math 105 in the fall and took Math 107 this spring. Of the other 7 students, five took and passed Math 055 in the fall and all five took Math 105 this spring. Spring grades are not yet available.

Overall it appears that students who take the Math Refresher and then immediately begin the math sequence as placed, successfully complete the courses.

- In order to assess the effectiveness of the placement exam, students in three sections of MATH S055 were given the opportunity to retake the placement exam during the last week of classes in the Fall 2012 term. The placement exam was offered free of charge and students were offered bonus homework points for their participation. After the conclusion of the semester, data was collected comparing the students Acuplacer score, corresponding placement, letter grade, and percent grade.

It was found that all of the students who placed into MATH 105 had a C or better in the course and those placing into MATH 055 largely had a C or D in the course. This suggests that the cutoff for placement into Math 105 is fairly accurate. On the other hand, some A/B students placed into MATH 055 and MATH 054, suggesting the arithmetic cutoff score might

be set too high. However, it is likely that the results of this experiment are not reliable due to self-selection bias, a lack of effort by students who knew the test did not "count" for anything, and a low participation rate.

- Juneau faculty attended webinars *ALEKS*, and *Math Emporium* to determine whether these products may be useful for Juneau based lower-division mathematics courses. Some faculty also attended a webinar on *Motivating Today's Students* with the intention of learning new strategies that they may apply to their own courses.
- The Juneau faculty conducted the Annual JDHS/TMHS Calculus Camp in April. This activity is used, to a certain degree, as a recruitment tool for new mathematics majors. Program faculty met with teachers and administrators of the Juneau School District in the Fall. However, as with most such interactions, there were no conclusive outcomes from this meeting.

**Proposed Program Changes/Measures Based on Assessment Results:** Actions worth mentioning include:

- Some Category C curriculum revisions were made to certain courses to better reflect their content, and clarify prerequisites.
- Andrzej Piotrowski will be conducting a Summer Research Program for UAS mathematics majors. This is funded by the Mathematical Association of America's "*National Research Experience for Undergraduates Program*," which seeks to strengthen underrepresented minority achievement in the mathematical sciences. This may be considered a pilot for future such efforts which will provide UAS mathematics majors with valuable experience, and a competitive edge when applying for employment, or admission to graduate programs.
- The UAS administration has been involved in extensive discussions on how to improve UAS mathematics courses. The mathematics program assessment coordinator has not been included in these discussions, and details on these discussions, or any conclusions, have not been made available.
- There have been discussions about aligning cut-scores for placements exams statewide. UAF conducted an analysis of the effectiveness of their cut-scores. For the most part, there are disagreements between UAF and UAA on this matter. Until an agreement between UAF and UAA is reached, UAS will retain the cut-scores currently in use.
- To align with the other MAU's, UAS will be offering SAT/ACT scores as an alternative means of placement for incoming students. It is expected that this will be implemented beginning Fall 2013.
- An in-depth analysis of historical (student success) data for all developmental, remedial, GER, and lower-division service courses offered by the Mathematics Program over AY 2001 – 2011 is under way. The goal of this project is to establish reasonably accurate information on past courses so as to provide a means of reliably measuring the effectiveness of any changes made to courses and/or assessment practices beginning AY 2012 onward. The findings of these analyses will be made available to relevant individuals.

**Assessment Plan Changes Based on Assessment Results:** The program's educational philosophy and guidelines for remedial, developmental and G.E.R. courses have been discussed regularly during the academic year. However, to date, specific changes have not been adopted.