

Mathematics Program

School of Arts & Science, University of Alaska Southeast

2009-10 Annual Report on Assessment of Student Learning Outcomes

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Goals/Objectives: The goals/objectives and methods of assessment for the Mathematics major and minor are detailed in the Program Assessment Plan, posted on the Provost's website, under *Quality of Graduates – Student Assessment*,

Data Collection and Analysis: Institutional data was unavailable for this annual report; however, an efficient data collection mechanism is almost complete.

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 discussions among program faculty at the three campuses.

Key Findings and Measures (2009-10): Changes proposed in the 2008-09 Annual Report have been implemented.

- As proposed in the 2008-09 Annual Report, efforts are underway to *track mathematics majors* as they progress through their respective programs of study. It is too early to draw any conclusions.
- With respect to *MATH 492: Senior Seminar Capstone Projects*, the proposed increased structure appears to have helped improve the quality of capstone presentations and papers somewhat. More time is needed for conclusive findings.
- Improved *coordination of distance delivered courses through Sitka and Ketchikan* continues to result in higher average class enrollments at the Ketchikan and Sitka campuses. These courses, all lower level mathematics and statistics courses, service students enrolled in both distance and on campus degree programs.

These high enrollments in lower level courses have permitted full-time faculty at both campuses to offer (potentially) low enrollment *local* courses for MATH 108, MATH 200 and MATH 201. The offering of these three courses at the Ketchikan and Sitka campuses benefit high school students from these two communities as well as those who are enrolled in the BLA general studies program.

The Mathematics Program remains opposed to offering these three courses by distance.

- The *UAS Online Program Assessment and Faculty Resource Site* is in place. In addition to containing all Program related documents, this site is to serve as a curriculum resource for faculty at the three campuses.
- Over Fall 2009 and Spring 2010, a *UAS Mathematics Program prepared text* was class tested in Juneau sections of MATH 054. Informal feedback from students was favorable. A third (and final) revision of the class test version will be tested during the 2010-11 academic year. This text is to be made available to students, if possible, free of cost.
- In the Fall of 2009 a mathematics major was utilized as a Teaching Assistant (TA) for the Juneau section of MATH S054. In Fall semesters this is typically a large class with very weak and/or unmotivated students. The primary purpose for having a TA was to assist the instructor (Hay-Jahans) in gathering qualitative and quantitative data pertaining to the new text (see above) as well to assess the effectiveness of an inquiry-based instructional approach used to teach the course. There was (informal) evidence to suggest that the inquiry-based approach was preferred over traditional lectures, and that the TA proved to be well appreciated and very effective during class exercise sessions used in presenting ideas and content. However, there was also ample evidence to suggest that the majority of students enrolled in this course required considerable assistance and guidance in areas other than mathematics.

Funds permitting, the Mathematics Program recommends the use of a TA, through the Juneau Learning Center, in large Juneau sections of this course. The benefits to the MATH 054 students and the TA, preferably a mathematics major seeking to complete the UAS MAT Program in Secondary School Teaching, lend support to this recommendation.

Program Changes/Measures Based on Assessment Results: No assessment driven changes are proposed for the upcoming academic year; however, some items/actions worth mentioning – since each may contribute directly or indirectly to student learning – include:

- An extension of Bryan Hitchcock's 3 year term position at the Juneau Campus was approved for AY 2011 - 2013. The Program views this position as being essential in providing faculty the ability to deliver an adequate number of developmental, remedial and general education requirement courses on the Juneau Campus.
- At the request of Virgil Fredenberg, the Mathematics faculty agreed to permit him to conduct *trial distance delivery offerings from Juneau of MATH S205 and MATH S206 during the 2011 academic year*. The rationale for using distance delivery for these courses, provided by Dr. Fredenberg, was that most elementary education majors at UAS obtain their degrees by distance.

While the mathematics faculty recognizes the reasoning behind this rationale, there is some concern with regard to the level of understanding students will gain from distance delivered versions of these courses, which truly should involve students in discussions and frequent interaction between faculty and students, and among students.

Mathematics faculty will conduct periodic observations of the two courses to determine if this method of instruction does indeed meet quality and effectiveness standards as claimed by Dr. Fredenberg.

It should be noted that these two courses are *Mathematics Program courses* (not School of Education courses) intended to provide future elementary school teachers a sound understanding and comfort level of *mathematics content* adequate for elementary school teachers.

- The Mathematics Program supported the submission of a *Title III Grant application by the Ketchikan Campus*, under the direction of Colleen Iannuzi, subject to certain changes in language. The goal is to use the Grant to enhance the Ketchikan Learning Center's capability in addressing the needs of distance students and develop a distance delivery MATH S055 course out of Ketchikan that will utilize the new enhanced features of the Ketchikan Learning Center.
- With respect to outreach, the Juneau faculty continues to conduct the Annual JDHS/TMHS Calculus Camp each Spring, and faculty at all three campuses provide miscellaneous other outreach activities/sessions throughout the year to local schools.

During the Summer of 2010, two Juneau faculty members, Brian Blitz and Andrzej Piotrowski, will contribute to the *Discover Design and Research Summer Camp* for high school students by conducting a session titled *Exploring the Mathematical Universe*.

- The Juneau campus will offer an *eight week MATH S108* course in the Summer of 2010. This is the first time this course will be offered during the summer. The intent is to allow (Juneau) students who take MATH S107 in the Spring semester an opportunity to enroll in MATH S200 in the Fall. Based on enrollment figures and the performance of students in the accelerated Summer 2010 MATH S108 course, the Program will determine whether or not to include this as a regular Juneau Summer course.
- The Juneau campus will also offer a trial *MATH S055 short-course* in Summer 2010. This course will meet three hours a day, four days a week for five weeks. It is uncertain how this course will be received by students (enrollment-wise), or whether an accelerated course is appropriate at this level. Observations will be shared with program faculty to enable a decision

as to whether such courses might be offered at the Juneau campus on a regular basis during summers.

- The Juneau Learning Center enhanced its *online learning resources* on the center's webpage for developmental and remedial mathematics students. The popularity and effectiveness of these resources are yet to be assessed.

In Spring 2010, Charles Salinas of the Juneau Campus Learning Center submitted a request to Juneau faculty to conduct a *survey of Juneau mathematics students for purposes of assessing student perceptions of the effectiveness of the Juneau Learning Center and the value of resources available*. Instructors for all Juneau mathematics courses provided their students access to the survey. Results of the survey will be analyzed by Charles Salinas over the summer.

- Some Juneau Campus mathematical/statistical software is to be upgraded. The latest versions of Geometer's Sketchpad and R will be installed on Juneau campus computers over the summer.
- Finally, the UAS Mathematics Program's proposal that UAS host the *2011 Annual Meeting of the Pacific Northwest Section of the Mathematical Association of America* has been accepted by the MAA and endorsed by the UAS Chancellor.

A meeting webpage has been included on the Mathematics Program website. This meeting will be held June 23 – 25, 2011 on the Juneau Campus.

This is a positive step toward further *regional recognition* of the UAS Mathematics Program /Faculty by peers in the Pacific Northwest. It is anticipated that attendees will not be limited to the Pacific Northwest.

Assessment Plan Changes Based on Assessment Results: No additional changes in the philosophy, purpose and structure of the mathematics program assessment plan have been made or proposed.