



Assessment of Program Effectiveness – Student Learning Outcomes

Year: 2007 – 2008 Academic Year

Department: Computer and Mathematical Sciences

Degree Program: Applied Mathematics [BS Degree] and Mathematics [BA Degree]

Learning Outcome Goal: Knowledge of Continuous Mathematics

For the 2007-2008 academic year, the assessment of student performance in Calculus I [Math 2401], Calculus II [Math 2402] and Calculus III [Math 2403] was reviewed. These three courses were chosen because the topics of limits, derivatives, and integrals are common in each of them, and in turn, these topics form the foundation of almost all undergraduate mathematics. In addition, the calculus courses are the prerequisite courses for many upper level courses in both the BS and BA degree programs. The materials selected for review in these courses were the final exams. These were selected because they constitute a good measure of the level of knowledge and understanding possessed by students in the continuous mathematical topics of limits, derivatives and integrals.

Assessment Procedure

The assessment of knowledge of continuous mathematics focused on the fundamental topics of limits, derivatives, and integrals. Two performance categories were specified: meeting or exceeding expectations [70% or better], and not meeting expectations [less than 70%]. The questions examining each of these topics were identified and the student scores were tabulated. Detailed performance lists for each course and for each student are on file with the Chair of Computer and Mathematical Sciences Department. The exams were grouped by course, Calculus I, Calculus II and Calculus III, and were reviewed by at least two separate faculty members. Evaluations took place individually during the week of March 10-14, 2008. Members of the Applied Mathematics Committee met several times during that week to compare and discuss the evaluations.

Assessment Results

The review of final exams for three Calculus I sections with a total of 45 students indicates: In the topic of limits 56% of the students, in the topic of derivatives 54% of the students, and in the topic of integrals 38% of the students meet or exceed expectations.
The review of final exams for two Calculus II sections with a total of 34 students indicates: In the topic of limits 53% of the students, in the topic of derivatives 47% of the students, and in the topic of integrals 44% of the students meet or exceed expectations.
The review of final exams for three Calculus III sections with a total of 44 students indicates: In the topic of limits 67% of the students, in the topic of derivatives 45% of the students, and in the topic of integrals 36% of the students meet or exceed expectations.

Results from all components of the assessment of this basic knowledge learning outcome were discussed. Moreover, the data was recorded for future reference and comparison during the next review of this basic knowledge outcome.

Interpretation and Use of Results

The above assessment activities represented the first detailed review of materials obtained from the calculus courses that are central components of the Bachelor of Science in Applied Mathematics degree and the Bachelor of Arts in Mathematics programs. At this stage, no attempt to reach any firm conclusions was made by the assessment committee. Initial findings and opinions that resulted from these assessment activities, along with the quantitative results obtained, will become part of a long-term data set and will be reviewed in conjunction with the next comparative assessment of these learning outcomes in the next assessment phase.

Meeting Notes

As noted above, the Committee made no attempts to propose refinements and adjustments to the program, as these results stem from only a single year's assessment. The data will be combined with future assessment data and upon collecting a substantial and representative data set, the Assessment Committee will evaluate the findings and make appropriate adjustments to the degree plan. This will begin in the fall of 2008.