



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: Understand and Write Proofs

For the 2007-2008 academic year, the assessment of student performance in Discrete Mathematics (Math 2305) was reviewed. This course was chosen because the course objectives include an introduction to mathematical proofs, helping students learn to reason logically and to communicate in the language of mathematics. These skills are fundamental in upper level math courses in both the BS and BA degree programs. The materials selected for review in this course were the final exams. These were selected because they constitute a good measure of the level of knowledge and/or proficiency possessed by students in understanding and writing proofs.

Assessment Procedure

The assessment of knowledge of understanding and writing mathematical proofs focused on the fundamental topics of logic, proof, and induction. 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 the course and for each student are on file with the Chair of Computer and Mathematical Sciences Department. The exams were reviewed by two separate faculty members. Evaluations took place individually during February-March, 2008. Members of the Applied Mathematics committee met several times during this time to compare and discuss the evaluations.

Assessment Results

The review of final exams for two Discrete Math sections with a total of 32 students indicates: In the topic of logic 72% of the students, in the topic of proof 28% of the students, and in the topic of induction 63% 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 discrete math course that is a central component 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 the assessment of but a single year. These data will be combined with future assessment data and upon amassing 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.

Independent of this assessment, the current Math 2305 faculty plans to design and incorporate online quizzes. The goal is to encourage students to maintain engagement in the course. A Quality Enhancement Plan (QEP) curriculum grant will support the development of these online quizzes. The online quizzes will be available for use the spring 2009. This activity may be used for future assessment of this learning outcome. Moreover, the effect of the online quizzes on this learning outcome can be tracked by future assessment data.