

Engineering Assessment

2010-2011

This year's assessment activity focused on student learning outcome 3, "Able to solve engineering problems." In order to assess this outcome standard questions were provided to students in mechanical engineering 241 (statics) and 242 (dynamics) to track their progress throughout the academic year. Questions were administered on quizzes and tests and scores were gathered as a part of course grading activity. The original assessment plan called for similar problems to be given to students in the introductory engineering course (ENGR 100) to assess progress as students get through the program. However, because many students take the courses out of sequence it was decided that collecting data in this manner would not provide the desired information.

The questions focused on the use of Newtonian mechanics to solve problems involving stable structures in both static and dynamic equilibrium (see Figure 1 for an example question). The ability to successfully determine the forces acting on these structures was evaluated by having students draw free body diagrams. On average students performed at a consistent level scoring between 75% and 85% on assigned tasks. However, very little improvement in average student performance was noted from fall to spring semester with scores staying in the 75% to 85% range. While the level of performance is satisfactory overall the lack of measureable improvement is of concern.

In order to address the lack of improvement a focus on the drawing of free body diagrams will be implemented across a range of course in the engineering program. Having students routinely practice the skill with consistent methods from course to course will hopefully help improve performance in this metric.

- (1) Draw a free body diagram for each block in the following system. The horizontal surface is NOT frictionless.

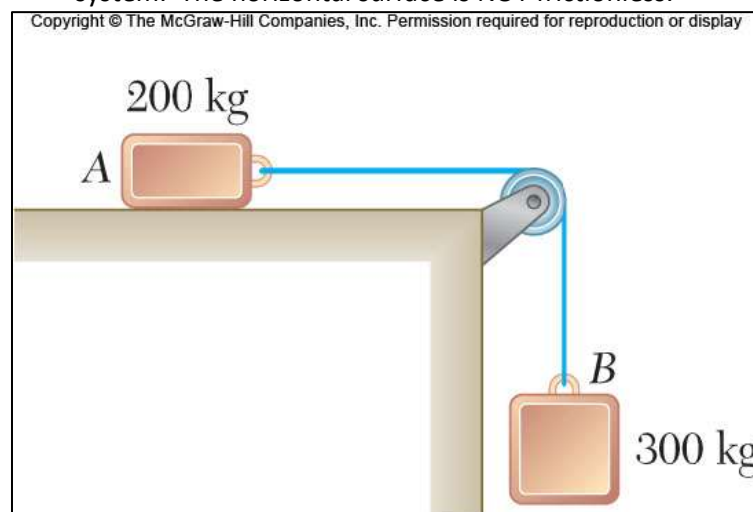


Figure 1. Example of a typical question used in the assessment.

Continuing with this assessment project for years would be desirable because the number of students sampled is very low for a single year. In order to properly measure the improvement in problem solving skills students should be tracked from their entry into the program until completion. Additionally, more data is necessary in order to collect a sufficient sample to validate the use of statistical methods used in the analysis.