FORM E-1-A FOR BOSTON COLLEGE DEPARTMENTS/PROGRAMS

DEPARTMENT OF MATHEMATICS
UNIVERSITY CORE

1) Have formal learning outcomes been developed? What are they? (What specific sets of skills and knowledge does the department expect students completing its Core courses to have acquired?)

In a Core course in Mathematics, students should:
- learn the nature of mathematical inquiry: abstraction and generalization;
- understand the power of mathematical reasoning to reach conclusions with assurance;
- communicate solutions clearly and effectively;
- study and appreciate applications of mathematics to other disciplines.

2) Where are these learning outcomes published? Be specific. (Where are the department’s expected learning outcomes for its Core courses accessible: on the web, in the catalog, or in your department handouts?)

A statement of the department’s commitment to assessing the success of our students, with descriptions of our goals, is available on the department’s website at http://www.bc.edu/content/bc/schools/cas/math/programassessment.html.

3) Other than GPA, what data/evidence is used to determine whether students have achieved the stated outcomes for the Core requirement? (What evidence and analytical approaches do you use to assess which of the student learning outcomes have been achieved more or less well?)

The department’s procedure is to collect evidence in two ways, direct and indirect.

(1) The Assessment Committee will periodically review final exams in specifically identified courses and rate carefully chosen problems with regard to the learning goals.

(2) The Assessment Committee will review student evaluations for those identified courses. If possible, instructors will be asked to add extra questions, designed by the Committee, to directly address the learning goals.

By far, the majority of our Core teaching is done in Calculus. One of our faculty members has begun a survey project to assess how we are meeting the fourth of our goals: giving students an appreciation of the application of mathematics to

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other disciplines. Specifically, the study will examine the pre-course and post-course beliefs of students taking single-variable calculus in two domains: general relevance of math and calculus to other fields and personal relevance of math and calculus. Some questions the project is looking to answer are:

- What are these beliefs and do they change after taking a single-variable course?
- Do beliefs and changes in beliefs vary across courses with different audiences? In particular, do they differ for the courses designed for math/science majors (1102/3/5) versus the non-math and science courses (1100/1)?
- Do student beliefs affect course performance and/or continuation to the next calculus course?
- Do beliefs vary across different populations, for example by gender or previous high school calculus experience?

Questions like these are important because there is evidence that relevance of the subject material outside the course can affect students’ motivation and persistence in their current and future courses. Understanding student beliefs about the relevance of calculus and math to other fields and how these change in gateway courses such as MATH11xx has the potential to inform curriculum and pedagogy to better support students in these courses and in their pursuit of majors in STEM and quantitative social sciences.

4) Who interprets the evidence? What is the process? (Who in the department is responsible for interpreting the data and making recommendations for curriculum or assignment changes if appropriate? When does this occur?)

The department’s Assessment Committee consists of four faculty members, chaired by the Assistant Chair for Undergraduates. The committee will review the data described in item 3 during the fall semester, with the goal of recommendations to the full department in the spring.