FORM E-1-A FOR BOSTON

More specifically, In AY 22-23, the Assistant Chair for Undergraduates (J. Belding, AY22-23) developed a multi-year Assessment Plan for Core Courses.

One key intended outcome is to identify common and necessary foundational content and learning goals for various courses, and determine success in meeting those goals. This can inform future curricular and pedagogical changes, when appropriate.

- In AY22-23, we have begun by examining our non-major Calculus core offerings, MATH1100 and 1101 in terms of content, recent curricular changes and course structure. For Math 1101, we used pre/post course survey data to assess how well these courses are meeting Core goals, specifically “

- In AY23-24, we plan to look at how

This course was redesigned in 2019 and piloted in 2020 in two sections. The goal was to address and working with functions of multiple variables and parameters (in part sparked by conversations with other departments). We also saw a decreased need for topics such as volumes of revolution and advanced integration techniques. The redesign included less integration, more differential equations and a new unit on multivariable functions and derivatives, with increased applications to life sciences and economics throughout. As the pilot was very successful, we incorporated the new curriculum in all our sections of MATH1101, beginning in Fall 2020.

More recently, to examine the effectiveness of this curriculum in promoting applications of calculus compared to the previous in terms, we analyw y2erio

majority, this will be their last Calculus course. Since Fall2020, various instructors have been re-thinking what would most help these students grow mathematically and have experimented with some curricular changes for Calculus.

The goal is to better meet some of our Core goals such as

and "

in ways that students can use in future work.

This Fall 2022, in the 400-person multi-section course, two main new priorities were introduced: working with functions with parameters (including how changing parameters affects behavior of limits, extrema, and rates of change) and using a problem-solving framework. These topics support students to more confidently approach unfamiliar problems and look for the mathematical structure in new formulas and functions they may encounter in other fields, such as a rate equation in biochemistry or a demand model in economics.

As a starting point for assessment of these changes, students were asked on course evaluations for two large sections of the course[1] about their agreement with:

"I feel more confident working with a function with parameters compared to when I started the course."

Student responses were very encouraging: 51% strongly agreed and 36% agreed. 12% were neutral and 1% disagreed.

Based on this, the course coordinator for F23 (Prof Belding) will update course materials about parameters and work to improve their use across all sections of the course.

Next steps include gathering student evaluation data for all sections, fall and spring, as well as using pre- and post-course survey data to look more closely at the impact on confidence on working with parameters and problem-solving, as well as other course goals.

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