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A technically-oriented four-year college finds most entering freshmen have previously studied calculus, but score insufficiently on validation criteria to place out of even one semester of college calculus. We propose a new course structure to address the needs of such students as an alternative to repeating a year of calculus. Topics from Calculus III are introduced without formal review of topics from Calculus I-II, but with additional time allotted for review just-in-time, on-demand, and in context. Even with additional time for review, students in the new course sequence complete Calculus III within two semesters of entering college rather than three. The new course sequence was tested in a pilot study. Students taking the new two-semester calculus sequence were compared to the rest of their cohort taking the standard three-semester sequence at several stages, based on their performance on multiple-choice questions common to both sets of final exams. Statistically significant differences in the proportion of students answering correctly were found on five of fourteen multiple-choice questions examined (with $\alpha = 0.05$ and correction for multiple testing); on all but one question, students in the new calculus sequence performed better than those in the standard sequence. (Received September 12, 2014)