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**Franque Michele Bains\*** (fbain001@ucr.edu), 3680 Monroe Street, Apt 901, Riverside, CA 92504, and **Borislava Gutarts** (gutarts@exchange.calstatela.edu), California State University, Los Angeles, Department of Mathematics, 5151 State University Drive, Los Angeles, CA 90032. *The Effects of Mandatory Homework on Mathematics Performance in an Undergraduate Calculus Course*. Preliminary report.

US students' performance in mathematics courses has been problematic for many years. In the discussion on the possible ways of improving students' performance, invariably the issue of homework and its impact on students' achievement gets raised. In this talk the authors will provide a brief overview of the literature on possible benefits of mandatory homework. The authors will present their recent experiment on the alleged benefits of mandatory homework. This experiment comprised of five sections of an undergraduate calculus course, where students were divided into two groups. Group 1 was administered mandatory (collected and graded) homework while Group 2 was assigned the same homework (not for collection or grade) and was instead given weekly quizzes. The goal was to measure the difference in the performance of the two groups, and the hypothesis was that Group 1 would outperform Group 2. The results will be revealed that may surprise many. In addition to the experimental study, the authors administered student opinion surveys, discussion of which will also be provided. The role of homework to facilitate learning will be analyzed, and the authors will propose two components to be incorporated into a class structure to best promote mathematics learning in college students. (Received September 15, 2009)