

University of Colorado at Boulder  
Department of Applied Mathematics

## Masters Thesis Defense

July 16, 2014  
10 AM  
ECOT 226 (Conference Room)

**Presenter**  
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**Title**  
The Effectiveness of Calculus Workgroup on Student Performance in  
Calculus: A Mixed-Methods Approach

Calculus Workgroup is a one-credit supplemental course to Calculus, and is used as a resource for those who want or need it. In the present study, we conduct a mixed-methods study to evaluate the effectiveness of Calculus 1 Workgroup on student performance in Calculus 1 for Engineers. We analyze a dataset that contains 733 observations and 35 predictor variables. We use AnswerTree software by SPSS to create decision trees to assess the biggest predicting factors for Calculus 1 course-grades. We then compare Workgroup students and non-Workgroup students based on factors resulting from AnswerTree, including predicted grade-point average (PGPA), to evaluate the effectiveness of Workgroup on student performance in Calculus. We find that in the academic year of 2013 - 2014, Workgroup did not significantly improve performance in Calculus.

We also analyze a survey taken by Workgroup students to have a better understanding of student attitudes toward Calculus, Workgroup, and Oral Assessments (a large component of Workgroup). Within the subgroup of Workgroup students, we compare students who are required to enroll in Workgroup to those who choose to enroll. We show that students who enroll in Workgroup have a higher PGPA on average than those who do not. We further show that students who are required to take Workgroup (by scholarship) have a significantly higher PGPA than students who choose to enroll in Workgroup. We note a negative correlation between the requirement to take workgroup, and positive self-concept of one's calculus ability.