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Defeating Ambiguity: Modeling Problems with Calculus

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1145-VF-301 **Andrew Plucker*** (andrew.plucker@usma.edu), andrew.plucker@usma.edu, West Point, NY 10996, and **William Corson** (william.corson@usma.edu), william.corson@usma.edu. *Defeating Ambiguity: Modeling Problems with Calculus.*

Many first year calculus students struggle to see the value in learning single variable calculus. They often focus their efforts on learning the rules of differentiation and integration, losing sight of the broader picture for how calculus is leveraged to solve problems. While rudimentary calculus problems are necessary for the sake of understanding basic rules and concepts, larger and more complex problems are critical to opening the doors for students to gain a practical understanding of the applications. Through a series of Problem Solving Labs and written reports, the single variable calculus program at West Point not only focuses on learning calculus, but also how the core concepts can be used to conduct quantitative analysis that can be communicated to decision makers.

Throughout the semester-long course, single variable calculus students complete 4 to 5 different Problem Solving Labs where they leverage technological tools such as excel and mathematica to develop mathematical models to formulate overall recommendations. Each lab report prompt is designed to present an ambiguous problem that requires critical assumptions to enable mathematical modeling. (Received August 29, 2018)