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Karoline Hood* (karoline.hood@usma.edu) and **Paul Goethals**. *Inspiring Engineers to Study Ordinary Differential Equations with Open-Ended Modeling Problems.*

Mathematics is the language of engineering. In order to solve engineering problems, students must learn this language in sufficient depth and breadth. Almost all engineers are required to take an engineering math course where they learn this breadth of knowledge to include a heavy focus on ordinary differential equations (ODEs). We examined the implementation of engineering projects in an undergraduate mathematics course, specifically designed to present open-ended problems related to a student's major. The problems, which utilize second-order ODEs in their formulation, include modeling beams oscillating due to earthquakes, the development of shock absorbers used by trucking companies, and measuring the electrical vibrations of a radio. Students were required to conduct their own research, use facts and assumptions to make their model as realistic as possible, and present their research to the instructor at the end of the course. One major focus of this project is the assessment of the student's ability to take his or her knowledge on ODEs, apply it to a model, and effectively communicate the model through visualization tools. Our talk will discuss the different projects, student output and performance, as well as the effect of open-ended applications-based work in the classroom. (Received August 04, 2017)