1145-R5-2270 **Andrew M. Baxter*** (`amb69@psu.edu`), **Amine Benkiran**, **Eric Simring**, **Russell deForest** and **Matthew Willyard**. *Let the Model Drive the Bus: A model-motivated approach to first-year calculus.*

The first-year biocalculus sequence at Penn State University has seen dramatic improvements in student achievement without compromising mathematical rigor or scalability. The success is due to various factors, but one major element is how we treat mathematical models as central to mathematical analysis. Each major calculus topic is introduced with a specific set of applications and models which drive our decision-making as to what is important, rather than work with the abstract concepts and bury their utility as a final homework problem. Since the course is intended for life science majors, we specifically sought out models from ecology, epidemiology, and biochemistry rather than the traditional Newtonian physics examples. We will provide an overview of the biocalculus sequence's success and share the mathematical models that motivate differentiation, integration, matrix algebra, and differential equations. (Received September 25, 2018)