

Abstract Submitted
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Preparing our students for downstream courses: how does modifying the curriculum impact student learning?¹ SARAH LEGRESLEY RUSH, MICHAEL MURRAY, CHRIS BRUNER², CHRIS FISCHER, University of Kansas — We wanted to explore how modifying the curriculum of an introductory calculus-based mechanics course would impact student learning. Currently, the curricula for most of these courses are structured with the concept of force introduced before the concept of energy despite the fact that, mathematically, it is simpler to learn and apply a scalar quantity than a vector quantity. With the idea of teaching scalars before vectors, we are using an “Energy First” approach that motivates the development of classical mechanics from the concepts of energy and energy conservation rather than forces. This “Energy First” curriculum also seeks to better prepare students for upper-level major courses by emphasizing calculus more than traditional approaches. Before implementing this curriculum department wide, we wanted to evaluate how it would impact student learning. Preliminary results of the Force Concept Inventory (FCI) assessment indicate that students taught using the “Energy First” approach scored as well or higher on the post-test in the six topic areas (Newton’s First Law, Newton’s Second Law, Newton’s Third Law, Kinds of Forces, Kinematics, and Superposition Principle) than students taught using the traditional approach.

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