Abstract Submitted
for the APR17 Meeting of
The American Physical Society

Instruction of Multidisciplinary Content in Introductory Courses
SAAMI J. SHAIBANI, Instruction Methods, Academics Advanced Scholarship (IMAAS) — There has been an ever-increasing emphasis on the integration of material in the areas of science, technology, engineering and mathematics during the past decade or so. However, there are two major requirements for accomplishing the effective delivery of such multidisciplinary content in the classroom: having high levels of expertise in all of the subjects; and, having the ability to combine the separate fields in a consistent manner without compromising academic purity. The research reported here involves a teacher with this skill set and it includes an example from kinematics, which is initially explored with standard treatment of concepts in mechanics and then developed with analysis employing algebra. As often happens, the non-trivial nature of the result in this case does not readily allow students to have a sense that the physics-based outcome is correct. This shortfall is remedied by adopting a complementary approach with geometry and calculus, which adds an independent perspective that reassures students by confirming the validity of the original answer. The enhanced quality of instruction achieved with the above methodology produces many benefits, including greater student understanding and more opportunities for active involvement by students in the learning process.

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Date submitted: 08 Aug 2016 Electronic form version 1.4