

Abstract Submitted
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A Conceptual Physics Course in General Relativity and Cosmology MICHAEL ZEILIK, University of New Mexico, M. JENNIFER MARKUS, University of New Mexico — We have designed, implemented, assessed, and revised a new conceptual physics course at the University of New Mexico. Using the NRC/NAS report “Connecting Quarks with the Cosmos” (2003) as a guide, we pared down the 11 questions to six based on a student poll. The instructor (MZ) reconceptualized these six into a one- semester course focused on general relativity and cosmology, while taking into account known misconceptions research. The full implementation of an active- learning version took place in Spring 2003. The classes contained about 2/3 males and 1/3 females, about 60% “freshmen.” Some 50course to meet a requirement. Students entered with a wide variety of math backgrounds, with the men reporting more advanced courses. We report on assessments to probe the success of the course based on our learning outcomes. In math and science aptitude, females and males ranked themselves the same at the start of the course; men felt more confident at the end. Using a conceptual diagnostic test as a pre- and post assessment, we found that males outscored the females pre- and post, but the normalized gains were the same. The normalized gains on Force Concept Inventory items was 0.2; for general relativity and cosmology ones, 0.5.

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