

Meeting: 1003, Atlanta, Georgia, MAA CP C1, MAA Session on Courses Below Calculus: A New Focus, I

1003-C1-278 **Jack A Picciuto*** (aj3178@usma.edu), Dept of Mathematical Sciences, United States Military Academy, West Point, NY 10996, and **Alex Heidenberg** (aa5178@usma.edu), Dept of Mathematical Sciences, United States Military Academy, West Point, NY 10996. *A Course BEFORE Calculus, but not necessarily BELOW Calculus.*

Under a grant from the NSF, the USMA math curriculum has been changing to better meet the future needs of our students. As part of our curriculum shift, we start all our incoming freshman with a course in modeling and problem solving. The course emphasizes applied mathematics through modeling — using effective problem solving strategies and modeling theory to solve complex and often ill-defined problems. The course exercises mathematical concepts while nurturing creativity, critical thinking, and learning through activities performed in disciplinary and interdisciplinary settings. The course concludes with an introduction to calculus using continuous and discrete mathematics in applied settings. The course exploits a variety of technological tools to develop numerical, graphical, and analytical solutions that enhance understanding. The course strengthens its role of providing a transition from the HS curriculum to the environment of an upper divisional college classroom by stressing mathematical modeling and functional notation, while introducing data analysis and computer application programs that support scientific inquiry. The presentation will include implementation issues, faculty development, and the initial results of our assessment of student attitudes and achievement. (Received September 07, 2004)