Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Tod-Down Physics MICHAEL SCHILLACI, University of South Carolina — Over the past 7 years I have worked to develop two, two-semester course sequences in Theoretical and Computational Physics appropriate for undergraduate education in Physics. Covering material traditionally handled in Classical Mechanics and Electricity and Magnetism, the Theoretical Physics sequence stresses mathematical rigor, physical insight and a project- based paradigm, covering topics such as Landing on the Moon, Realistic Tidal Models, and The Solar Sail. A two-volume text (recently adopted by Mercer University) has been developed for the Computational Physics sequence and introduces students to the essentials of Maple, LaTeX and JAVA as well as web-page (HTML, JavaScript) publishing. While the bulk of the first semester is devoted to software use and algorithm development (i.e., numerical integration) wrote homework is supplemented by "group quiz and project activities. In the second semester laboratory experiments such as the Toothpick Toss, The Not-So-Simple Harmonic Oscillator and the Chaotic Diode are performed and then computational simulations are developed using various tools (i.e., JAVA, Visual Basic, Matlab).

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Date submitted: 13 Jan 2006 Electronic form version 1.4