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What Computational Approaches Should be Taught for Physics?[1]

RUBIN LANDAU, Oregon State University — The standard *Computational Physics* courses are designed for upper-level physics majors who already have some computational skills. We believe that it is important for first-year physics students to learn modern computing techniques that will be useful throughout their college careers, even before they have learned the math and science required for Computational Physics. To teach such *Introductory Scientific Computing* courses requires that some choices be made as to what subjects and computer languages wil be taught. Our survey of colleagues active in Computational Physics and Physics Education show no predominant choice, with strong positions taken for the compiled languages Java, C, C++ and Fortran90, as well as for problem-solving environments like Maple and Mathematica. Over the last seven years we have developed an Introductory course and have written up those courses as text books for others to use. We will describe our model of using both a problem-solving environment and a compiled language. The developed materials are available in both Maple and Mathaematica, and Java and Fortran90[2].

[1]Computational Physics Degree Program, Oregon State University
[2]Princeton University Press, to be published; www.physics.orst.edu/~rubin/IntroBook/

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