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# Integration and Evaluation of Coding in First Year Integrated Physics and Calculus Courses.

*Wednesday 5 June 2019 12:00 (15 minutes)*

It has been recognized that computational skills are essential for the modern physicist, whether as a third "branch"of physics alongside experimental and theoretical, or as a toolset that is fundamental to the work of both theorists and experimentalists. In recognition of this, both the American Association of Physics Teachers and the American Physical Society have issued calls for computational instruction to be included at an appropriate level in undergraduate physics curricula. We selected two consecutive first year integrated physics and calculus courses aimed at physical science majors to create situations where students were learning physics and computing together. Python coding, via the Jypyter Notebooks system, was introduced in a carefully scaffolded system in several of the courses'laboratory exercises, and was assigned to students in a Modeling Theory case-study assignment in each course. We analyze students'coding proficiency, both perceived (through surveys and discussions) and actual (through coding achievement on the assignments) and evaluate whether students'familiarity, comfort, and skill in computational physics have been elevated through these exposures.

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