

Getting Started With Computation

In the past, every time I have taught a class in Differential Equations, Linear Algebra, or Calculus I, II, III, and IV, I have given students MATLAB assignments. My goal with these assignments has been to get students comfortable enough with MATLAB to be able to use it in other classes they take. This has worked, because I do get students telling me they were glad they learned MATLAB and it was useful in their other classes.

What didn't feel right to me has been having all students in the first quarter of Calculus learn some MATLAB, even though for some of the students, it was the last math class they were taking and they would never have the chance to use MATLAB again. After thinking about this problem for the past year, and then attending a PICUP [1] workshop and conference, I found out that the American Association of Physics Teachers [2] recommends that students first learn about computation through spreadsheets. Spreadsheets are simple to use and have the advantage of displaying the results of all calculations, so students can see what is happening. Also, spreadsheets are used in a wide variety of careers, so the ability to use spreadsheets is a useful skill for students to learn. Then, after having some experience with computation using a spreadsheet, students will find it easier to move to an integrated mathematical computing package, like MATLAB.

There is a lot to consider when introducing or improving the computational component of a course. For information on how to implement a successful program to develop computational skills, I recommend the Computational Skills Guide [3].

References

1. PICUP: partnership for Integration of Computation into Undergraduate Physics
<https://www.compadre.org/picup/>
2. AAPT Recommendations for Computational Physics in the Undergraduate Physics Curriculum
[AAPT UCTF CompPhysReport final B.pdf](#)
3. EP3 – Effective Practices for Physics Programs, Computational Skills
[Computational Skills | Effective Practices for Physics Programs \(ep3guide.org\)](#)