Integrating Computation into introductory courses at ECU

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Outline

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Context of our changes

About ECU:

- Regional Masters University (30,000 students and growing)

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About ECU:

- Regional Masters University (30,000 students and growing)
- Economically depressed region (Median household income figures)
  - Greenville, NC (home of ECU): $46,573
  - Washington, NC (20 min east of campus): $30,280
  - National Median: $59,039
  - Washington DC: $75,506

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- Pre-tenure (beginning 4^{th} year)

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Approach 1: One language (VPython)

Context:

- Course: Calc-based Intro Physics I
- Interactive lectures: Tutorial-style activities, some with computation
- Weekly recitation sessions: Lots of early computation

Information about computational exercises:

- Language: VPython
- Utilize MWEs with extensive scaffolding.
- Focused on Kinematics and Newton's laws: Series on projectile motion.

`trinket.io` course link.

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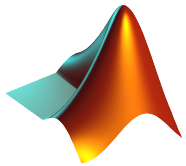
Approach 2: Many languages

Students come from many majors which require/support different computational tools

- Biology
- Chemistry
- Math
- Engineering

So we "provide" a buffet of free/university supported choices.






Students choose the one that they have the most experience with.

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Broad lessons learned

1. Small change is better than no change.

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2. Don't work alone. . .

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2. Don't work alone...
3. ...and find someone smarter than you.

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1. Small change is better than no change.
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4. Figure out how to include computation in your assessments.

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Broad lessons learned

1. Small change is better than no change.
2. Don't work alone...
3. ...and find someone smarter than you.
4. Figure out how to include computation in your assessments.
5. Students will complain...and that is ok.

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Sometimes students come around

Coding is important too

I wanted to thank you Dr. Wolf. I took your Physics I class, when you did all of the `VPython` stuff, and I hated it. I didn't understand why I had to learn how to code, I wanted to learn more equations and stuff like that. Then I took an internship year. Do you know what, you were right!

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(Lightly paraphrased)

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