

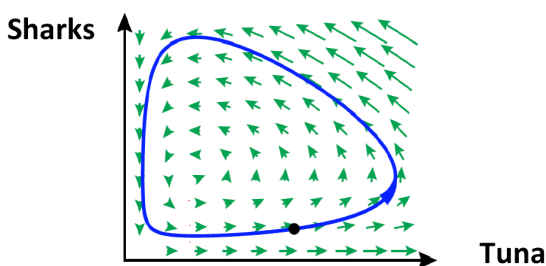
# Online Seminar on Undergraduate Mathematics Education

## Teaching dynamics to biology undergrads

**Alan Garfinkel, UCLA**

There is a need to reform how we introduce math to beginning students in Life Science. The usual “Calculus for Life Sciences”, which is a watered down version of Calculus I, possibly including some trivial biological examples, has failed to inspire students. Even worse, the math gateway courses into the life sciences serve as powerful filters keeping women and under-represented minorities out of the life sciences and medicine. We designed such a course, and are currently teaching it to ~2000 students/year. The course introduces students, on day 1, to the concept of modeling a system that has multiple interacting variables and nonlinear relations. The student quickly learns that models give rise to ‘change equations’ and that these differential equations can always be “solved” (that is, simulated numerically) using Euler’s method. They learn to program their own code for

Euler’s method in a Python-like environment. Throughout, there is an emphasis on biological applications of these concepts, such as feedback behaviors in physiology and ecology, oscillations in insulin and glucose levels and in biological populations.



**Noon ET, October 10, 2023**

Zoom link: <https://cornell.zoom.us/j/92415199317>, passcode olsume

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