

Abstract Submitted
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Learning physical biology via modeling/simulation: An interdisciplinary undergraduate course¹ PHILIP NELSON, Univ of Pennsylvania — Undergraduate life-science curricula remain largely rooted in descriptive approaches, even though much current research involves quantitative modeling. Not only does our pedagogy not reflect current reality; it also reinforces the silos that prevent students from connecting disciplines. I'll describe a course that has attracted undergraduates in several science and engineering majors. Students acquire research skills that are often not addressed in traditional undergraduate courses, using a general-purpose platform like MATLAB or Python. The combination of experimental data, modeling, and physical reasoning used in this course represents an entirely new mode of "how to learn" for most of the students. These basic skills are presented in the context of case studies from cell biology, specifically control theory and its applications to synthetic biology. Documented outcomes include student reports of improved ability to gain research positions as undergraduates, and greater effectiveness in such positions, as well as students enrolling in more challenging later courses than they would otherwise have chosen.

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