Written for intermediate-level undergraduates pursuing any science or engineering major, Philip Nelson’s textbook helps students develop key research competencies not often addressed in traditional courses—modeling, data analysis, programming, and more—all in the context of case studies from living systems.

Features
Students acquire research skills that are not often addressed in traditional courses:

- Basic modeling skills, including dimensional analysis, identification of variables, and ODE formulation
- Probabilistic modeling skills, including stochastic simulation
- Data analysis methods, including maximum likelihood and Bayesian methods
- Computer programming using a general-purpose platform like MATLAB or Python, with short codes written from scratch
- Dynamical systems, particularly feedback control, with phase portrait methods

All of these basic skills, which are relevant to nearly any field of science or engineering, are presented in the context of case studies from living systems, including:

- Virus dynamics
- Bacterial genetics and evolution of drug resistance
- Statistical inference
- Superresolution microscopy
- Synthetic biology
- Naturally evolved cellular circuits, including homeostasis, genetic switches, and the mitotic clock

To purchase at CourseSmart, visit:
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EPILOGUE

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