

Modeling Biological Systems

Principles and Applications

Designed for advanced undergraduate and graduate students, this state-of-the-art textbook describes the essentials on how to create and analyze mathematical and computer simulation models. It offers a comprehensive understanding of the underlying principles as well as details and equations applicable to a wide variety of biological systems and disciplines. Students will walk away from this text with the tools necessary to produce their own models.

The text contains two major sections: Principles and Applications. The first section discusses the principles of biological systems with a thorough description of the essential modeling activities of formulation, implementation, validation, and analysis. These activities are illustrated by a set of example models taken from recent and classical literature, chosen for their breadth of coverage and current timeliness.

The second section of the text, covering applications, takes a closer look at the fundamental equations and problems from various biological disciplines, such as biochemistry, plant and animal physiology, and ecology. Some exciting new approaches to modeling are also discussed in this section, including individual-based models, nonlinear dynamics, cellular automata, neural networks, genetic algorithms, and artificial life.

Expertly crafted, this textbook helps students in departments of biological science, zoology, agriculture, entomology, botany, forestry, fisheries and wildlife, and natural environmental science, acquire the skills necessary to read current modeling literature as well as construct their own models. The book is intended as a first course in mathematical and computer simulation modeling for students with little advanced training in mathematics but with an expansive background in biology.

About the author:

James W. Haefner is an Associate Professor in the Department of Biology at Utah State University, Logan, Utah.

JOIN US ON THE INTERNET

WWW: <http://www.thomson.com>

EMAIL: findit@kiosk.thomson.com

Visit Chapman & Hall's Internet Resource Center for information on our new publications, links to useful sites on the World Wide Web and an opportunity to join our e-mail mailing list. Point your browser to:

<http://www.chaphall.com/chaphall.html> or

<http://www.chaphall.com/chaphall/lifesci.html> for Life Sciences

A service of **ITP**



Chapman & Hall
115 Fifth Avenue
New York, NY 10003

2-6 Boundary Row
London SE1 8HN

Printed in U.S.A.

ISBN 0-412-04201-0



9 780412 042010

