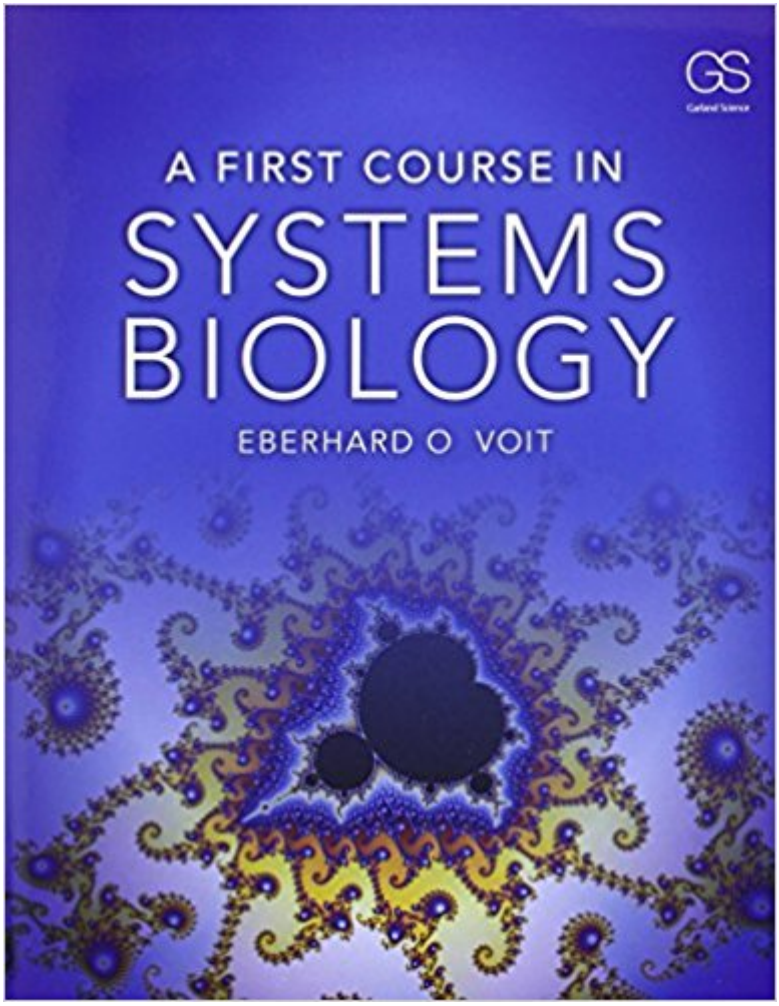
A First Course In Systems Biology



Synopsis

A First Course in Systems BiologyÃ Â is a textbook designed for advanced undergraduate and graduate students. Its main focus is the development of computational models and their applications to diverse biological systems. Because the biological sciences have become so complex that no individual can acquire complete knowledge in any given area of specialization, the education of future systems biologists must instead develop a student's ability to retrieve, reformat, merge, and interpret complex biological information. This book provides the reader with the background and mastery of methods to execute standard systems biology tasks, understand the modern literature, and launch into specialized courses or projects that address biological questions using theoretical and computational means. The format is a combination of instructional text and references to primary literature, complemented by sets of small-scale exercises that enable hands-on experience, and larger-scale, often open-ended questions for further reflection.

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Customer Reviews

As someone who has been working in systems biology since before the term was even coined, I can be pretty critical of any nascent texts on the subject, now that academic biology departments are starting to give the field its proper due. But part of the problem in the field, all the way back to May and Morowitz, is that the obscure and esoteric mathematics of dynamical systems theory has been inaccessable to most classical biologists, let alone to the public. Fields such as bioinformatics have made clear the importance of mathematics and computational science to biology, but the world

of modeling and simulation has remained on the edges of biology only until recently.Most texts on systems biology have tended to focus on the mathematics without much more. Here is a book that tries something rather bold, to address the whole expanse of systems biology, with a minimalist mathematical approach, and a more a practical perspective on real world application. If you are a biologist looking for a first look at systems biology that does not assume you dream in Lyapunov exponents, this is the book for you. It is well illustrated with an almost historical context providing perspective on the field and just enough math to pique your interest without scaring you away. If you fancy yourself a Ramanujan, there are a number of great books that dive into the mathematical abyss with abandon, such as Armin Fuchs' text. But if you are new to the application of dynamical systems theory to biology and to mathematical and computational modeling of the same, then this is your "start here" users manual road map for the more partiuclar detail you will need once you are hooked. This is the perfect book for an introductory upper division undergraduate or preliminary graduate course in systems biology.

This is a powerful introduction to systems biology from one of its internationally recognized leaders. The book presents the origins, concepts, tools, state of the art, and future directions in systems biology research. One of the book's many outstanding features is its real emphasis on both "systems" and "biology." On one hand, it highlights the principles and general advantages of the systems-oriented approach and mathematical modeling in (molecular) biology. On the other hand, it shows how concrete biological questions and phenomena (from cellular signal transduction to heart physiology) motivate and drive modeling research. The book's other features include its accessibility, balanced and highly relevant selection of material, highlights of the connection between modeling and experimental data, and suitability for audiences with mathematical or biological backgrounds. The reader can also choose between more introductory or more advanced levels of exposition. For example, Chapter 5 "Parameter Estimation" is a helpful reference even for a seasoned systems biology scientist. Yet, Chapter 6 "Gene Systems" starts with a description of the basic building blocks of life and then proceeds to discuss current experimental methods of gene expression analysis. Several areas addressed in the book have been advanced by the author's own research, which obviously adds to the book's overall value. While the book is mainly focused on deterministic finite-dimensional systems, it conceptually prepares the reader to use other computational frameworks to solve biological problems. I strongly recommend this book to anyone with a serious interest in systems biology.

A good choice for beginers in systems biology. Clear explanations and good examples. A First course in systems biology is a nice choice for those who want to start learning systems biology.

Great textbook - I’m taking a class taught by Dr Voit himself!

Great product.

The book is full of unclear explanations that require my professor to add notes to most homework problems and often introduce alternative reading material.The kindle experience is poor on Mac because, 1) scrolling is revered from the OS X default, 2) scrolling is ridiculously chunky and unintuitive, 3) the software often crashes with this book (more so than other books).