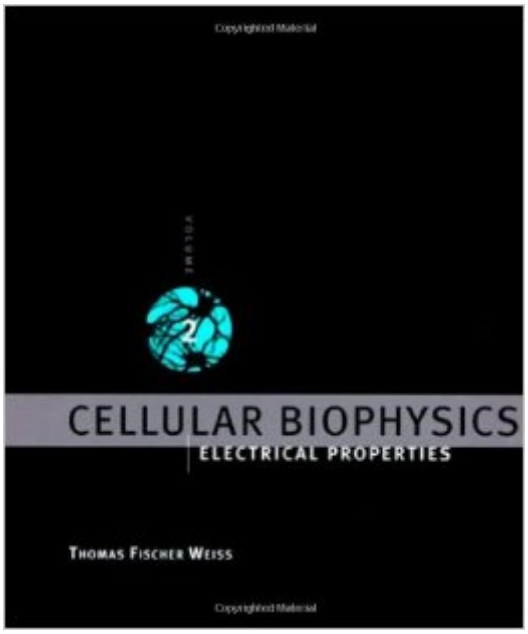
Cellular Biophysics, Vol. 2: Electrical Properties



Synopsis

Cellular Biophysics is a quantitatively oriented basic physiology text for senior undergraduate and graduate students in bioengineering, biophysics, physiology, and neuroscience programs. It will also serve as a major reference work for biophysicists.Developed from the author’s notes for a course that he has taught at MIT for many years, these books provide a clear and logical explanation of the foundations of cell biophysics, teaching transport and the electrical properties of cells from a combined biological, physical, and engineering viewpoint.Each volume contains introductory chapters that motivate the material and present it in a broad historical context. Important experimental results and methods are described. Theories are derived almost always from first principles so that students develop an understanding of not only the predictions of the theory but also its limitations. Theoretical results are compared carefully with experimental findings and new results appear throughout. There are many time-tested exercises and problems as well as extensive lists of references.The volume on the electrical properties of cells covers both electrically inexcitable cells as well as electrically excitable cells such as neurons and muscle cells. Included are chapters on lumped-parameter and distributed-parameter models of cells, linear electric properties of cells, the Hodgkin-Huxley model of the giant axon of the squid, saltatory conduction in myelinated nerve fibers, and voltage-gated ion channels.

Book Information

Series: Bradford Books
Hardcover: 450 pages
Publisher: A Bradford Book (March 6, 1996)
Language: English
ISBN-10: 0262231840
ISBN-13: 978-0262231848
Product Dimensions: 8.2 x 1.5 x 9.1 inches
Shipping Weight: 3.3 pounds
Average Customer Review: 4.2 out of 5 starsÂ Â See all reviewsÂ (4 customer reviews)
Best Sellers Rank: #810,256 in Books (See Top 100 in Books) #151 inÂ Books > Science & Math > Biological Sciences > Biophysics #295 inÂ Books > Medical Books > Basic Sciences > Cell Biology #598 inÂ Books > Science & Math > Biological Sciences > Biology > Molecular Biology

Customer Reviews

Many books claim to be self-contained. A typical self-contained book usually has an appendix and

breifly discusses some mathematical preliminaries, etc. that seldom helps a genuine beginner. A typical ``self-contained book'' is also somewhat thin to incorporate all the necessary background.This is a THICK volume.And, wow, this book shows you step-by-step how to get a solution of the cable equation. To be quite honest the approach was not entirely satisfactory nor is there any attempt to go beyond the passive membrane. However, I found many precious pieces that you cannot find in any other books. The only drawback is, I believe, this book is too thorough for a beginner. Nonetheless it makes a good reference book.

This is a mathematical cell neurophysiology tour de force which gives the most up to date information on the cable equations. Anyone doing research on that small area will find an enormous wealth of information here. It is good as a reference text on cable equation derivations. The book is based on lectures given by Thomas Weiss at MIT in Biophysics. It was a tough course I am sure. This book is for serious mathematical neuroscientists.

For derivations of the cable equation and single-channel models, this book is unmatched. On the down-side, the coverage of related experimental neurobiology is quite dated.

This book is in good condition. Thanks!!

Fundamentals, Modelling, Applications (NATO Science for Peace and Security Series B: Physics and Biophysics) Molecular Modeling at the Atomic Scale: Methods and Applications in Quantitative Biology (Series in Computational Biophysics) Biophysics of Electron Transfer and Molecular Bioelectronics (Electronics and Biotechnology Advanced (Elba) Forum Series) Electrostatic Effects in Soft Matter and Biophysics: Proceedings of the NATO Advanced Research Workshop on Electrostatic Effects in Soft Matter and ... 1-13 October 2000 (Nato Science Series II:)