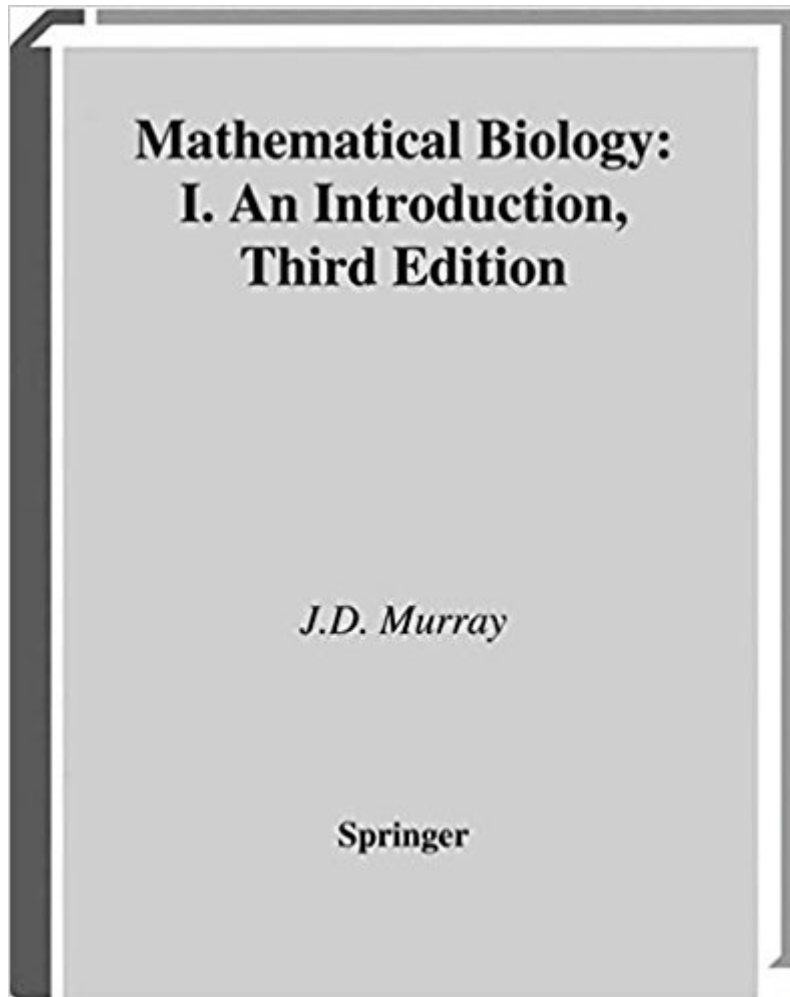# Mathematical Biology: I. An Introduction (Interdisciplinary Applied Mathematics) (Pt. 1)

Synopsis

Mathematical Biology is a richly illustrated textbook in an exciting and fast growing field. Providing an in-depth look at the practical use of math modeling, it features exercises throughout that are drawn from a variety of bioscientific disciplines - population biology, developmental biology, physiology, epidemiology, and evolution, among others. It maintains a consistent level throughout so that graduate students can use it to gain a foothold into this dynamic research area.

Book Information

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Customer Reviews

A few decades ago mathematical biology consisted mostly of evolutionary and predator-prey models. This has changed dramatically in recent years with the advent of computational biology and gene sequencing projects. The applications of mathematics to biology are now exploding and this book is an excellent example of that. The book could best be described as the application of nonlinear dynamical systems and reaction-diffusion partial differential equations to biology structures and processes. Readers with background in these areas of mathematics will find their ideas applied beautifully in this book. The best sections of the book for me were the discussions of synchronized insect emergence, models of testosterone secretion control, insect dispersal models, calcium waves on amphibian eggs, mammalian coat patterns, models of hallucination patterns in the brain, and modeling the transmission dynamics of HIV. Numerous exercises end each chapter, and the mathematical algorithms can easily be coded in Mathematica or some other high level

language. This is a fine addition to the literature on mathematical biology and for the price it is a real bargain.

This book is an excellent reference in the field. In fact, this book introduces almost sub-disciplinaries in the Mathematical Biology. Nevertheless, this book is not an introduction for beginners. Moveover, the mathematical analysis, the ordinary differential equation, the nonlinear nondynamics and chaos should be mastered before reading this excellent textbook.

This book is a classic. I basically skimmed through this (partly a reflection of a current dificulty with focus and concentration). This book covers a large number of areas: simple population models, sex determination in crocodiles, mathematical models of marriage, biological oscillators, diffusion and chemotaxis, wave phenomena in biological systems and finally a brief discussion of fractals in biology (uses and misuses).There is a systematic exploration of these various models and the important insights from linearization, perturbation methods for stability analysis was repeatedly illustrated. The graphics with comparisons to experimental data were well chosen and demonstrated.The book highlighted to me deeo deficits in my knowledge and forms motivation for reducing my ignorance. I am looking forward to the Second Volume which explores spatial patterns and excitable media.

This book is the first of two volumes by the author on the topic and is an important addition to a series of Interdisciplinary Applied Mathematics volumes by the publisher. A comprehensive and interesting overview of mathematical approaches in modelling bioscience and biomedical phenomena. Topics including; kinetics, diffusion, nonlinear dynamics, feedback and control theory are covered. The material is significant and relevant to interdisciplinary physical scientists, engineers or mathematicians who are involved in the biomedical sciences. Each chapter reviews practical modelling strategies and includes exercises.

This text is simply an outstanding experince, not only for life science related issues, but relevant also for chemistry, physics, mathematics, and social sciences. The presentation secuence of the models and their level of presentation as well as their relevance is impressing. I recomend the experience to every curious mind, interested in the procesess that rule nature as described by mathematics. The price-quality relation is best.

So useful for theoretician biologists ! No need to say more !

Biology: The Ultimate Self Teaching Guide - Introduction to the Wonderful World of Biology - 3rd Edition (Biology, Biology Guide, Biology For Beginners, Biology For Dummies, Biology Books) Mathematical Biology: I. An Introduction (Interdisciplinary Applied Mathematics) (Pt. 1) Mathematical Biology II: Spatial Models and Biomedical Applications (Interdisciplinary Applied Mathematics) (v. 2) Mathematical Physiology (Interdisciplinary Applied Mathematics) Foundations of Educational Technology: Integrative Approaches and Interdisciplinary Perspectives (Interdisciplinary Approaches to Educational Technology) Nonlinear Systems: Analysis, Stability, and Control (Interdisciplinary Applied Mathematics) Computational Inelasticity (Interdisciplinary Applied Mathematics) (v. 7) Introduction to Computational Biology: Maps, Sequences and Genomes (Chapman & Hall/CRC Interdisciplinary Statistics) Handbook of Mathematical Functions: with Formulas, Graphs, and Mathematical Tables (Dover Books on Mathematics) Mathematical Control Theory: Deterministic Finite Dimensional Systems (Texts in Applied Mathematics) Pocket Book of Integrals and Mathematical Formulas, 5th Edition (Advances in Applied Mathematics) Some Mathematical Questions in Biology: The Dynamics of Excitable Media (Lectures on Mathematics in the Life Sciences) The Mathematical Olympiad Handbook: An Introduction to Problem Solving Based on the First 32 British Mathematical Olympiads 1965-1996 (Oxford Science Publications) Knowing and Teaching Elementary Mathematics: Teachers' Understanding of Fundamental Mathematics in China and the United States (Studies in Mathematical Thinking and Learning Series) Algorithms in Bioinformatics: A Practical Introduction (Chapman & Hall/CRC Mathematical and Computational Biology) Mathematical Modeling in Systems Biology: An Introduction (MIT Press) Introduction to Mathematical Structures and Proofs (Undergraduate Texts in Mathematics) Discrete Mathematics: Introduction to Mathematical Reasoning Elementary Cryptanalysis: A Mathematical Approach (Mathematical Association of America Textbooks) Elementary Algebraic Geometry (Student Mathematical Library, Vol. 20) (Student Mathematical Library, V. 20)