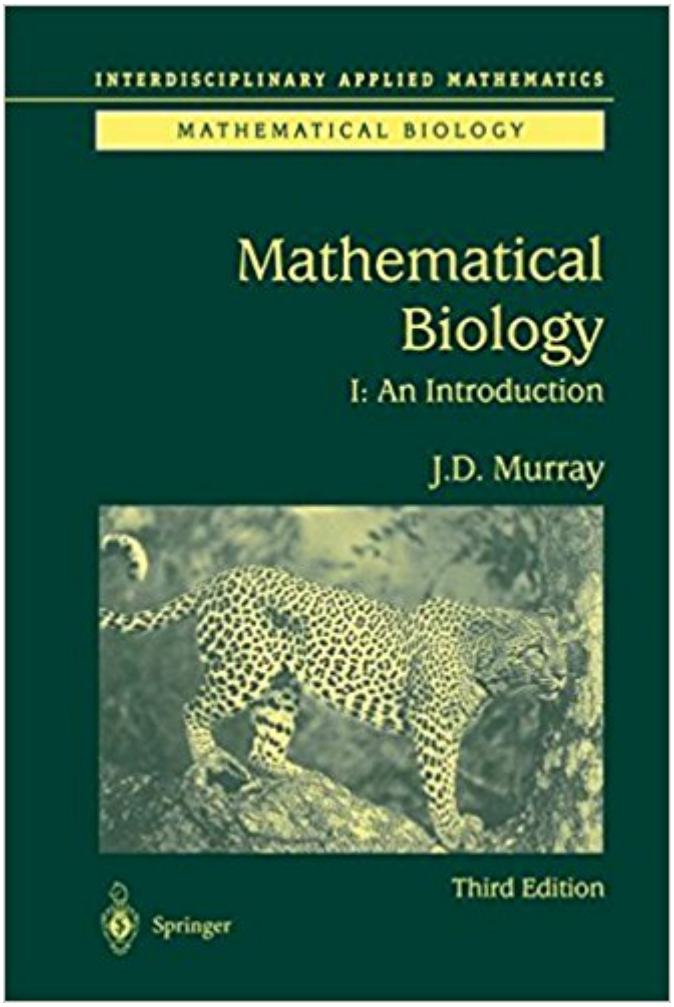
Mathematical Biology: I. An Introduction (Interdisciplinary Applied Mathematics) (Pt. 1)



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

Reviews of the original edition: "Murray has produced a magnificent compilation of mathematical models and their applications in biology." Nature "Murray's Mathematical Biology belongs on the shelf of any person with a serious interest in mathematical biology." Bulletin of Mathematical Biology SIAM, 2004: "Murray's Mathematical Biology is a classic that belongs on the shelf of any serious student or researcher in the field. Together the two volumes contain well over 1000 references, a rich source of material, together with an excellent index to help readers quickly find key words. ... I recommend the new and expanded third edition to any serious young student interested in mathematical biology who already has a solid basis in applied mathematics." From the reviews of the third edition: "Mathematical Biology would be eminently suitable as a text for a final year undergraduate or postgraduate course in mathematical biology â | . It is also a good source of examples for courses in mathematical methods â | . Mathematical Biology provides a good way in to

the field and a useful reference for those of us already there. It may attract more mathematicians to work in biology by showing them that there is real work to be done." (Peter Saunders, The Mathematical Gazette, Vol. 90 (519), 2006)

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.

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

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 is the bible, folks

Nice book, in great condition and it got in the right place at the right time.

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 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.

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.

Mathematics (Contemporary Mathematics) An Introduction to Systems Biology: Design Principles of Biological Circuits (Chapman & Hall/CRC Mathematical and Computational Biology) Mathematical Problems from Combustion Theory (Applied Mathematical Sciences) (v. 83) Introduction to Computational Biology: Maps, Sequences and Genomes (Chapman & Hall/CRC Interdisciplinary Statistics) Applied Functional Analysis: Main Principles and Their Applications (Applied Mathematical Sciences) Handbook of Mathematical Functions: with Formulas, Graphs, and Mathematical Tables (Dover Books on Mathematics) Applied Mathematical Demography (Statistics for Biology and Health) Mathematical Optimization and Economic Theory (Classics in Applied Mathematics) The Principles of Mathematical Analysis (International Series in Pure & Applied Mathematics)