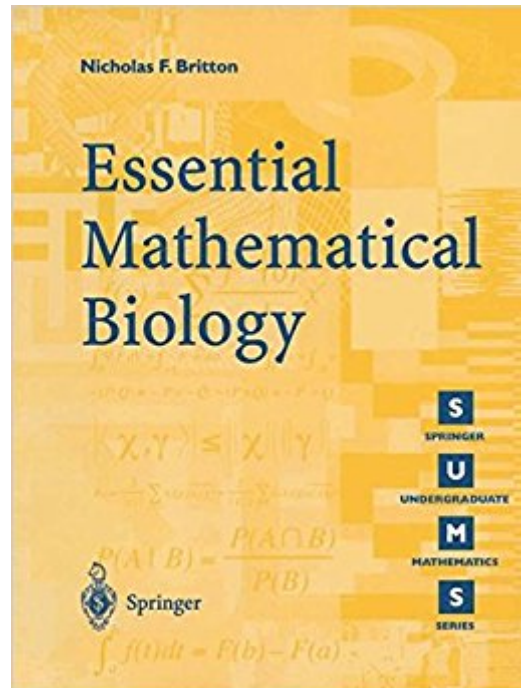




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# Essential Mathematical Biology



## Synopsis

This self-contained introduction to the fast-growing field of Mathematical Biology is written for students with a mathematical background. It sets the subject in a historical context and guides the reader towards questions of current research interest. A broad range of topics is covered including: Population dynamics, Infectious diseases, Population genetics and evolution, Dispersal, Molecular and cellular biology, Pattern formation, and Cancer modelling. Particular attention is paid to situations where the simple assumptions of homogeneity made in early models break down and the process of mathematical modelling is seen in action.

## Book Information

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## Customer Reviews

From the reviews: It explains its chosen topics clearly and simply, not including extraneous material, and is written at a level that can be understood and appreciated by undergraduate students. Indeed, the level of writing is superb in its clarity and elegance... Just as useful as the writing style are the appendices and hints. Not only does Britton give elementary presentations of some basic mathematical techniques (difference equations, ODEs and PDEs) he also gives extensive hints for the exercises, bordering on complete solutions in some cases. This is a resource that will surely prove extremely useful for all teachers of such a course...there is no denying that *Essential Mathematical Biology* is superbly designed for the purpose it serves, and will, I am sure, become a popular text book across the world. UK Nonlinear News Britton explains how difference and

differential equations have been used to formulate theory and description in biology, but at a level accessible to undergraduate mathematics, physics or engineering majors. His very readable style achieves clear and largely jargon-free explanations with no sacrifice of mathematical rigour.....Clearly intended to be read and used as a course textbook, another attractive feature of this volume is the inclusion of interesting and relevant exercises after each subchapter section, together with an appendix of hints to help students work and understand them. Other appendices efficiently review the mathematical techniques and concepts that are basic to the applications presented in the chapters....I believe that *Essential Mathematical Biology* will enrich the personal library of any scholar interested in applied differential equations. The Quarterly Review of Biology, Volume 79, No. 2 "This excellent monograph provides a very readable introduction to the most important aspects of mathematical biology.  $\hat{\phi}$   $\rightarrow \hat{\alpha}$  The book contains numerous exercises, with hints for the solutions, a guide for further studies, and interesting historical comments. An index helps in finding the many concepts and equations introduced in the monograph. This is a most welcome addition to the literature." (Jean Mawhin, Bulletin of the Belgian Mathematical Society, Vol. 12 (1), 2005) "This book as a textbook covers a diversity of topics from mathematical biology. Its content is best summarized by the title of its eight substantial Chapters.  $\hat{\phi}$   $\rightarrow \hat{\alpha}$  It poses questions of current research interest, providing a comprehensive overview of the field and a solid foundation for interdisciplinary research in the biological sciences.  $\hat{\phi}$   $\rightarrow \hat{\alpha}$  includes many exercises as well as detailed solutions for them.  $\hat{\phi}$   $\rightarrow \hat{\alpha}$  a good introduction for those beginners that are interested in the fast growing field of mathematical biology." (Lan-Sun Chen, Mathematical Reviews, 2003m) "Each chapter of this textbook provides a brief introduction into an important area of mathematical biology.  $\hat{\phi}$   $\rightarrow \hat{\alpha}$  In addition, there are four appendices, comprising about one fourth of the whole text, which summarize important techniques  $\hat{\phi}$   $\rightarrow \hat{\alpha}$ . The book is aimed at the undergraduate level  $\hat{\phi}$   $\rightarrow \hat{\alpha}$ . Many exercises, together with hints for their solution, complement this text which will be useful as a first introduction." (R. Bfger, Monatshefte ffr Mathematik, Vol. 143 (4), 2004) "In brevity and simplicity lies the great strength of this book. It explains its chosen topics clearly and simply  $\hat{\phi}$   $\rightarrow \hat{\alpha}$  that can be understood and appreciated by undergraduate students. Indeed, the level of writing is superb  $\hat{\phi}$   $\rightarrow \hat{\alpha}$ . Just as useful as the writing style are the appendices and the hints.  $\hat{\phi}$   $\rightarrow \hat{\alpha}$  will surely prove extremely useful for all teachers of such a course.  $\hat{\phi}$   $\rightarrow \hat{\alpha}$  will, I am sure, become a popular text book across the world." (James Sneyd, UK Nonlinear News, June, 2004) "Britton writes a book that provides for an introductory account of mathematical biology.  $\hat{\phi}$   $\rightarrow \hat{\alpha}$  Many examples are given  $\hat{\phi}$   $\rightarrow \hat{\alpha}$ . The figures are clear and precise. All mathematical formulae, equations and models are complete, clear and readable.  $\hat{\phi}$   $\rightarrow \hat{\alpha}$  The material in the

book is clear and concise. The book provides the reader with a wealth of information and is well suited as a textbook for a course in mathematical biology. I highly recommend this book. It makes a worthwhile addition." (Paul Johnson, New Zealand Mathematical Society Newsletter, Issue 90, April, 2004) "It was a great pleasure reading Essential Mathematical Biology. the book is very well written without large jumps in the mathematical reasoning, it is also quite concise and covers a large amount of material. The writing and style are very clear. The mathematical steps are laid out neatly with clear definitions and notation. The book is a great contribution to students interested in mathematical biology and a source of important insights for biological scientists." (D. Kault, The Australian Mathematical Society, Vol. 31 (1), 2004) "This book is a self-contained introduction to the fast-growing field of mathematical biology. it sets the subject in its historical context and then guides the reader towards questions of current research interest, providing a comprehensive overview of the field and a solid foundation for interdisciplinary research in the biological sciences. A broad range of topics is covered." (L'Enseignement Mathématique, Vol. 49 (3-4), 2003) "Those of us in mathematical biology like to imagine our field on the verge of achieving critical opalescence. it is a pleasure and challenge to share the wide spectrum of problems and approaches with eager undergraduates from various backgrounds. Several textbooks are available, now including Essential Mathematical Biology by Nicholas Britton. The author exemplifies interdisciplinary approaches. Essential Mathematical Biology would serve well as a template for an advanced undergraduate or beginning graduate course." (Fred Adler, Physics Today, March, 2004) "Each of the eight chapters starts with a brief list of clearly expressed goals, questions or explanations, well motivating the reader to enter the chapter by introducing him into the essential biological problems and their importance. I can fully recommend to use this undergraduate mathematics textbook in any theoretical or practical computer course introducing into Mathematical Biology, but also for other teaching or education purposes within this interdisciplinary field of growing importance between Mathematics, Scientific Computing, Bioinformatics, Systems Biology, Ecology, Physiology and Biomedicine." (Wolfgang Alt, Mathematical Biosciences, Vol. 208, 2007)

Interesting book. Pedagogical.

This book introduces a variety of essential concepts and fundamental knowledge in the mathematical biology, such as SIR model, prey-predator model and Turing Instability. Thus, some

students who are focusing on mathematics, ecology and even biochemistry, tend to find sparks in this book. On the other hand, the basic mathematical techniques provided in the appendixes may daunt readers with less fluent ability of mathematics, especially in the differential equation.

I sent a sample of the Kindle version to my PC, where I read kindle books, and the readability was poor. The figures and formulas are very hard to read ... fuzzy, in my opinion.

In a world in which the precision of the knowledge is fundamental the alive beings' description and their relationships raise the necessary being mathematically. However a lack of titles that you/they can take this Mathematics to the professionals of the biological field exists. The title of this book summarizes in exemplary way that he intends and it gets. Fundamental reading for all those that they are impassioned by the life, but they don't lose common sense in you understand her.

The book came in very good shape. But it is not as useful as I thought.

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