ALGEBRAIC AND DISCRETE MATHEMATICAL METHODS FOR MODERN BIOLOGY

RAINA ROBEVA, EDITOR

Inspired by the national initiative toward a new biology, this work offers a collection of modules introducing methods from modern discrete mathematics into the undergraduate math and biology curricula. Each module begins with a question from contemporary biology, followed by the description of mathematical methods and theory appropriate for the search of answers. Projects and exercises embedded in the text utilize freely accessible or widely available software for visualization, simulation, and analysis used in modern biology research. This book is appropriate for mathematics courses such as finite mathematics, discrete structures, linear algebra, abstract/modern algebra, graph theory, probability, bioinformatics, statistics, biostatistics, and modeling, as well as for biology courses such as genetics, cell and molecular biology, biochemistry, ecology, and evolution. The companion website includes solutions to all exercises and additional materials including tutorials, projects, data sets, and computer code.

Key Features

- Examines significant questions in modern biology and their mathematical treatments
- Presents important concepts and methods from discrete mathematics in the context of essential biology
- Features material appropriate for both mathematics and biology courses
- Presents chapters in modular format, so coverage does not need to follow the Table of Contents
- Introduces projects appropriate for undergraduate research
- Requires no calculus as a prerequisite

Raina Robeva was born in Sofia, Bulgaria. She has a PhD in Mathematics from the University of Virginia and has led multiple NSF-funded curriculum development projects at the interface of mathematics and biology. She is the lead author of the textbook *An Invitation to Biomathematics* (2008) and the lead editor of the volume *Mathematical Concepts and Methods in Modern Biology: Using Modern Discrete Models* (2013), both published by Academic Press. Robeva is the founding Chief Editor of the research journal *Frontiers in Systems Biology*. She is a professor of Mathematical Sciences at Sweet Briar College and lives in Charlottesville, Virginia.

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