

Contents

Preface	vii	Chapter 9: Is It Normal?: Sampling, Statistics, and the Central Limit Theorem	137
Acknowledgments	ix		
Chapter 1: On the Road: Dynamical Models of Infectious Diseases and Physical Systems	1	Chapter 10: Lather, Rinse, Repeat: A Gentle Introduction to Computer Programming	159
Chapter 2: Outbreaks: Modeling an Infectious Disease Outbreak with Differential Equations	15	Chapter 11: Agents of Change: Computational Models of Genetic Drift	169
Chapter 3: Building a Better Cat: Building a Predator-Prey Model and Chaos	33	Chapter 12: Ducks in a Row: Bioinformatics and Algorithmic Approaches to Biological Data	187
Chapter 4: Survival of the Fastest: Modeling Competition between Species and between Cells	53	Chapter 13: Life on a Tree: Phylogenetics	203
Chapter 5: Emergence: Genetic Dominance as an Emergent Property of Biochemical Models	69	Chapter 14: Life in a Net: Network Tools for Modeling Complex Systems from a Cell to an Ecosystem	229
Chapter 6: Growing Too Big: Full-Cell Metabolic Models	87	Chapter 15: Scale: Metabolic Rate, Body Size, and Fractal Geometry	247
Chapter 7: Shrinking Too Small: Noise in Biochemical Systems	107	Chapter 16: Bits: Life as an Information Transfer Process	271
Chapter 8: Time and Chance: Probability and Random Variables	121	Glossary	289
		Index	293