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Biology: the Dynamics of Life-Alton Biggs 1999-04-01 General biology text with National Geographic features in each unit and test-taking tips written by the Princeton Review.

Concepts of Biology-Samantha Fowler 2018-01-07 Concepts of Biology is designed for the single-semester introduction to biology course for non-science majors, which for many students is their only college-level science course. As such, this course represents an important opportunity for students to develop the necessary knowledge, tools, and skills to make informed decisions as they continue with their lives. Rather than being mired down with facts and vocabulary, the typical non-science major student needs information presented in a way that is easy to read and understand. Even more importantly, the content should be meaningful. Students do much better when they understand why biology is relevant to their everyday lives. For these reasons, Concepts of Biology is grounded on an evolutionary basis and includes exciting features that highlight careers in the biological sciences and everyday applications of the concepts at hand. We also strive to show the interconnectedness of topics within this extremely broad discipline. In order to meet the needs of today's instructors and students, we maintain the overall organization and coverage found in most syllabi for this course. A strength of Concepts of Biology is that instructors can customize the book, adapting it to the approach that works best in their classroom. Concepts of Biology also includes an innovative art program that incorporates critical thinking and clicker questions to help students understand--and apply--key concepts.

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Fundamentals of Molecular Structural Biology-Subrata Pal 2019-08-13 Fundamentals of Molecular Structural Biology reviews the mathematical and physical foundations of molecular structural biology. Based on these fundamental concepts, it then describes molecular structure and explains basic genetic mechanisms. Given the increasingly interdisciplinary nature of research, early career researchers and those shifting into an adjacent field often require a "fundamentals" book to get them up-to-speed on the foundations of a particular field. This book fills that niche. Provides a current and easily digestible resource on molecular structural biology, discussing both foundations and the latest advances Addresses critical issues surrounding macromolecular structures, such as structure-based drug discovery, single-particle analysis, computational molecular biology/molecular dynamic simulation, cell signaling and immune response, macromolecular assemblies, and systems biology Presents discussions that ultimately lead the reader toward a more detailed understanding of the basis and origin of disease

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Dynamics of Cancer-Steven A. Frank 2018-06-05 The onset of cancer presents one of the most fundamental problems in modern biology. In Dynamics of Cancer, Steven Frank produces the first comprehensive analysis of how particular genetic and environmental causes influence the age of onset. The book provides a unique conceptual and historical framework for understanding the causes of cancer and other diseases that increase with age. Using a novel quantitative framework of reliability and multistage breakdown, Frank unifies molecular, demographic, and evolutionary levels of analysis. He interprets a wide variety of observations on the age of cancer onset, the genetic and environmental causes of disease, and the organization of tissues with regard to stem cell biology and somatic mutation. Frank uses new quantitative methods to tackle some of the classic problems in cancer biology and aging: how the rate of increase in the incidence of lung cancer declines after individuals quit smoking, the distinction between the dosage of a chemical carcinogen and the time of exposure, and the role of inherited genetic variation in familial patterns of cancer. This is the only book that presents a full analysis of the age of cancer onset. It is a superb teaching tool and a rich source of ideas for new and experienced researchers. For cancer biologists, population geneticists, evolutionary biologists, and demographers interested in aging, this book provides new insight into disease progression, the inheritance of predisposition to disease, and the evolutionary processes that have shaped organismal design.

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Biology for AP® Courses-Julianne Zedalis 2017-10-16 Biology for AP® courses covers the scope and sequence requirements of a typical two-semester Advanced Placement® biology course. The text provides comprehensive coverage of foundational research and core biology concepts through an evolutionary lens. Biology for AP® Courses was designed to meet and exceed the requirements of the College Board's AP® Biology framework while allowing significant flexibility for instructors. Each section of the book includes an introduction based on the AP® curriculum and includes rich features that engage students in scientific practice and AP® test preparation; it also highlights careers and research opportunities in biological sciences.

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Chromatin Regulation and Dynamics-Anita Göndör 2016-10-25 Chromatin Regulation and Dynamics integrates knowledge on the dynamic regulation of primary chromatin fiber with the 3D nuclear architecture, then connects related processes to circadian regulation of cellular metabolic states, representing a paradigm of adaptation to environmental changes. The final chapters discuss the many ways chromatin dynamics can synergize to fundamentally contribute to the development of complex diseases. Chromatin dynamics, which is strategically positioned at the gene-environment interface, is at the core of disease development. As such, Chromatin Regulation and Dynamics, part of the Translational Epigenetics series, facilitates the flow of information between research areas such as chromatin regulation, developmental biology, and epidemiology by focusing on recent findings of the fast-moving field of chromatin regulation. Presents and discusses novel principles of chromatin regulation and dynamics with a cross-disciplinary perspective Promotes crosstalk between basic sciences and their applications in medicine Provides a framework for future studies on complex diseases by integrating various aspects of chromatin biology with cellular metabolic states, with an emphasis on the dynamic nature of chromatin and stochastic principles Integrates knowledge on the dynamic regulation of primary chromatin fiber with 3D nuclear architecture, then connects related processes to circadian regulation of cellular metabolic states, representing a paradigm of adaptation to environmental changes

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Single Molecule Biology-Alexander E. Knight 2009-02-26 Single molecule techniques, including single molecule fluorescence, optical tweezers, and scanning probe microscopy, allow for the manipulation and measurement of single biological molecules within a live cell or in culture. These approaches, amongst the most exciting tools available in biology today, offer powerful new ways to elucidate biological function, both in terms of revealing mechanisms of action on a molecular level as well as tracking the behaviour of molecules in living cells. This book provides the first complete and authoritative treatment of this rapidly emerging field, explicitly from a biological perspective. The contents are organized by biological system or molecule. Each chapter discusses insights that have been revealed about their mechanism, structure or function by single molecule techniques. Among the topics covered are enzymes, motor proteins, membrane channels, DNA, ribozymes, cytoskeletal proteins, and other key molecules of current interest. An introduction by the editor provides a concise review of key principles and an historical overview. The last section discusses applications in molecular diagnostics and drug discovery. * Organized by biological system or molecule. * Each chapter discusses insights into mechanism of action, structure, and function * Covers enzymes, motor proteins, membrane channels, DNA, ribozymes, etc. * Includes an introduction to key principles and an historical overview. * Discusses applications in molecular diagnostics and drug discovery. * Provides an expert's perspective on future developments.

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Dynamic Systems Biology Modeling and Simulation-Joseph DiStefano III 2015-01-10 Dynamic Systems Biology Modeling and Simulation consolidates and unifies classical and contemporary multiscale methodologies for mathematical modeling and computer simulation of dynamic biological systems – from molecular/cellular,

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organ-system, on up to population levels. The book pedagogy is developed as a well-annotated, systematic tutorial – with clearly spelled-out and unified nomenclature – derived from the author’s own modeling efforts, publications and teaching over half a century. Ambiguities in some concepts and tools are clarified and others are rendered more accessible and practical. The latter include novel qualitative theory and methodologies for recognizing dynamical signatures in data using structural (multicompartmental and network) models and graph theory; and analyzing structural and measurement (data) models for quantification feasibility. The level is basic-to-intermediate, with much emphasis on biomodeling from real biodata, for use in real applications. Introductory coverage of core mathematical concepts such as linear and nonlinear differential and difference equations, Laplace transforms, linear algebra, probability, statistics and stochastics topics; PLUS The pertinent biology, biochemistry, biophysics or pharmacology for modeling are provided, to support understanding the amalgam of “math modeling” with life sciences. Strong emphasis on quantifying as well as building and analyzing biomodels: includes methodology and computational tools for parameter identifiability and sensitivity analysis; parameter estimation from real data; model distinguishability and simplification; and practical bioexperiment design and optimization. Companion website provides solutions and program code for examples and exercises using Matlab, Simulink, VisSim, SimBiology, SAAMII, AMIGO, Copasi and SBML-coded models. A full set of PowerPoint slides are available from the author for teaching from his textbook. He uses them to teach a 10 week quarter upper division course at UCLA, which meets twice a week, so there are 20 lectures. They can easily be augmented or stretched for a 15 week semester course. Importantly, the slides are editable, so they can be readily adapted to a lecturer’s personal style and course content needs. The lectures are based on excerpts from 12 of the first 13 chapters of DSBMS. They are designed to highlight the key course material, as a study guide and structure for students following the full text content. The complete PowerPoint slide package (~25 MB) can be obtained by instructors (or prospective instructors) by emailing the author directly, at: joed@cs.ucla.edu

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Dynamics of Advanced Sustainable Nanomaterials and Their Related Nanocomposites at the Bio-Nano Interface-Niranjan Karak 2019-07-30 Dynamics of Advanced Sustainable Nanomaterials and Their Related Nanocomposites at the Bio-Nano Interface highlights the most recent research findings (conducted over the last 5-6 years) on the dynamics of nanomaterials, including their multifaceted, advanced applications as sustainable materials. In addition, special attributes of these materials are discussed from a mechanistic and application point-of-view, including their sustainability and interfacial interactions at the bio-nano interface and different applications. This book presents an important reference resource on advanced sustainable nanomaterials for chemical, nano-, and materials technologists who are looking to learn more about advanced nanocomposites with sustainable attributes. Finally, the book examines the emerging market for sustainable materials and their advanced applications, with a particular focus on the bio-nano interface and their future outlook. Features detailed information on the fundamentals of bio-nano interfacial interactions in sustainable nanomaterials Includes advanced applications of these materials that will help the end user select the appropriate materials for their desired application Features extensive information on the dynamics of these materials, helping the end user extend their work into new applications

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Biology 2e-Mary Ann Clark 2018 Biology 2e (2nd edition) is designed to cover the scope and sequence requirements of a typical two-semester biology course for science majors. The text provides comprehensive coverage of foundational research and core biology concepts through an evolutionary lens. Biology includes rich features that engage students in scientific inquiry, highlight careers in the biological sciences, and offer everyday applications. The book also includes various types of practice and homework questions that help students understand -- and apply -- key concepts. The 2nd edition has been revised to incorporate clearer, more current, and more dynamic explanations, while maintaining the same organization as the first edition. Art and illustrations have been substantially improved, and the textbook features additional assessments and related resources.

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Modeling of Microscale Transport in Biological Processes-Sid Becker 2016-12-27 Modeling of Microscale Transport in Biological Processes provides a compendium of recent advances in theoretical and computational modeling of biotransport phenomena at the microscale. The simulation strategies presented range from molecular to continuum models and consider both numerical and exact solution method approaches to coupled systems of equations. The biological processes covered in this book include digestion, molecular transport, microbial swimming, cilia mediated flow, microscale heat transfer, micro-vascular flow, vesicle dynamics, transport through bio-films and bio-membranes, and microscale growth dynamics. The book is written for an advanced academic research audience in the fields of engineering (encompassing biomedical, chemical, biological, mechanical, and electrical), biology and mathematics. Although written for, and by, expert researchers, each chapter provides a strong introductory section to ensure accessibility to readers at all levels. Features recent developments in theoretical and computational modeling for clinical researchers and engineers Furthers researcher understanding of fluid flow in biological media and focuses on biofluidics at the microscale Includes chapters expertly authored by internationally recognized authorities in the fundamental and applied fields that are associated with microscale transport in living media

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Nonlinear Dynamics of Financial Crises-Ionut Purica 2015-03-28 When just a handful of economists predicted the 2008 financial crisis, people should wonder how so many well educated people with enormous datasets and computing power can be so wrong. In this short book Ionut Purica joins a growing number of economists who explore the failings of mainstream economics and propose solutions developed in other disciplines, such as sociology and evolutionary biology. While it might be premature to call for a revolution, Dr. Purica echoes John Maynard Keynes in believing that economic ideas are "dangerous for good or evil." In recent years evil seems to have had the upper hand. "Nonlinear Dynamics of Financial Crises" points to their ability to do good. Makes complex economics ideas accessible by carefully explaining technical terms and minimizing mathematics and equations Delivers easily-understood perspectives about the global economy by constructing broad assumptions and conclusions in the face of its infinitely complexity Challenges received economic ideas by focusing on human behavior and the roles it plays in easily-observable recent trends and events

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Dynamics of Marine Ecosystems-K. H. Mann 2013-04-16 The new edition of this widely respected text providescomprehensive and up-to-date coverage of the effects ofbiological–physical interactions in the oceans from themicroscopic to the global scale. considers the influence of physical forcing on biologicalprocesses in a wide range of marine habitats including coastalestuaries, shelf-break fronts, major ocean gyres, coral reefs,coastal upwelling areas, and the equatorial upwelling system investigates recent significant developments in this rapidlyadvancing field includes new research suggesting that long-term variability inthe global atmospheric circulation affects the circulation of oceanbasins, which in turn brings about major changes in fish stocks.This discovery opens up the exciting possibility of being able topredict major changes in global fish stocks written in an accessible, lucid style, this textbook isessential reading for upper-level undergraduates and graduatestudents studying marine ecology and biological oceanography

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Microtubules, in vitro-John J. Correia 2013-08-20 There continues to be intense interest in the microtubule cytoskeleton; the assembly, structure and regulation of microtubules; and the numerous motors and accessory proteins that control cell cycle, dynamics, organization and transport. The field continues to grow and explore new aspects of these issues driven immensely by developments in optical imaging and tracking techniques. This 2e brings together current research and protocols in the field of microtubules in vitro and will serve as a valuable tool for cell biologists, biophysicists and pharmacologists who study the microtubule cytoskeleton, as well as for researchers in the biomedical and biotechnology communities with interest in developing drugs that target microtubules, MAPS and motors. Chapters reflect

experimental procedures and new developments in the field of microtubule in vitro research Combines classical approaches and modern technologies Presents easy-to-use protocols and thorough background information, compiled by leaders in the field

Dynamic Studies in Biology-Maurice Goeldner 2006-03-06 With contributions by more than 30 expert researchers, this handbook covers the whole spectrum from chemistry to cell biology and from theory to application. In so doing, it deals with a broad range of topics from the chemistry and biophysics of caged compounds to their application in time-resolved studies, comparing the properties of different caging groups. The authors describe in detail light-activation of proteins as well as nucleic acids, while a special section is devoted to multiphoton phototriggeres. A must-have for every biochemist, biophysicist and molecular biologist developing and working with these novel methods.

Cytoskeletal Dynamics and Organization During the Bovine First Cell Cycle-Christopher S. Navara 1995

Nonlinear Dynamics, Mathematical Biology, And Social Science-Joshua M. Epstein 2018-03-08 These lectures develop simple models of complex social processes using nonlinear dynamics and mathematical biology. Dynamical analogies between seemingly disparate social and biological phenomena,revolutions and epidemics, arms races, and ecosystem dynamics,are revealed and exploited. Nonlinear Dynamics, Mathematical Biology, and Social Science invites social scientists to relax,in some cases abandon,the predominant assumption of perfectly informed utility maximization and explore social dynamics from such perspectives as epidemiology and predator-prey theory. The volume includes a concentrated course on nonlinear dynamical systems.

Dynamics and Thermodynamics in Hierarchically Organized Systems-P. Auger 2013-10-22 One of the most fundamental and efficient ways of conceptualizing complex systems is to organize them hierarchically. A hierarchically organized system is represented by a network of interconnected subsystems, each of which has its own network of subsystems, and so on, until some elementary subsystems are reached that are not further decomposed. This original and important book proposes a general mathematical theory of a hierarchical system and shows how it can be applied to very different topics such as physics (Hamiltonian systems), biology (coupling the molecular and the cellular levels), ecology (coupling the individual, population and ecosystem), and economics (coupling the sectoral, regional and national levels). The first attempt to develop mathematical frameworks for conceptualizing such systems only appeared in the early 1970s, and it took another decade before these mathematical frameworks were applied to various specific contexts of the sciences of the natural. Much of this work has been pioneered by the author, and he presents a more thorough work which will have a major impact on shifting current thinking in the sciences of the natural to a more holistic basis in which several levels of hierarchically organized systems are viewed in an integrated fashion.

Mathematical Concepts and Methods in Modern Biology-Raina Robeva 2013-02-26 Mathematical Concepts and Methods in Modern Biology offers a quantitative framework for analyzing, predicting, and modulating the behavior of complex biological systems. The book presents important mathematical concepts, methods and tools in the context of essential questions raised in modern biology. Designed around the principles of project-based learning and problem-solving, the book considers biological topics such as neuronal networks, plant population growth, metabolic pathways, and phylogenetic tree reconstruction. The mathematical modeling tools brought to bear on these topics include Boolean and ordinary differential equations, projection matrices, agent-based modeling and several algebraic approaches. Heavy computation in some of the examples is eased by the use of freely available open-source software. Features self-contained chapters with real biological research examples using freely available computational tools Spans several mathematical techniques at basic to advanced levels Offers broad perspective on the uses of algebraic geometry/polynomial algebra in molecular systems biology

Eco-evolutionary Dynamics-Andrew P. Hendry 2020-06-09 In recent years, scientists have realized that evolution can occur on timescales much shorter than the 'long lapse of ages' emphasized by Darwin - in fact, evolutionary change is occurring all around us all the time. This work provides an authoritative and accessible introduction to eco-evolutionary dynamics, a cutting-edge new field that seeks to unify evolution and ecology into a common conceptual framework focusing on rapid and dynamic environmental and evolutionary change.

Glencoe Biology: The Dynamics of Life, Reinforcement and Study Guide, Student Edition-McGraw-Hill Education 2003-06-12 Study Guide and Reinforcement Worksheets allow for differentiated instruction through a wide range of question formats. There are worksheets and study tools for each section of the text that help teachers track students' progress toward understanding concepts. Guided Reading Activities help students identify and comprehend the important information in each chapter.

Algebraic and Discrete Mathematical Methods for Modern Biology-Raina Robeva 2015-05-09 Written by experts in both mathematics and biology, Algebraic and Discrete Mathematical Methods for Modern Biology offers a bridge between math and biology, providing a framework for simulating, analyzing, predicting, and modulating the behavior of complex biological systems. Each chapter begins with a question from modern biology, followed by the description of certain mathematical methods and theory appropriate in the search of answers. Every topic provides a fast-track pathway through the problem by presenting the biological foundation, covering the relevant mathematical theory, and highlighting connections between them. Many of the projects and exercises embedded in each chapter utilize specialized software, providing students with much-needed familiarity and experience with computing applications, critical components of the "modern biology" skill set. 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. Examines significant questions in modern biology and their mathematical treatments Presents important mathematical concepts and tools in the context of essential biology Features material of interest to students in both mathematics and biology Presents chapters in modular format so coverage need not follow the Table of Contents Introduces projects appropriate for undergraduate research Utilizes freely accessible software for visualization, simulation, and analysis in modern biology Requires no calculus as a prerequisite Provides a complete Solutions Manual Features a companion website with supplementary resources

Biophysical Methods in Cell Biology- 2015-01-29 This new volume of Methods in Cell Biology looks at methods for analyzing of biophysical methods in cell biology. Chapters cover such topics as AFM, traction force microscopy, digital holographic microscopy, single molecule imaging, video force microscopy and 3D multicolor super-resolution screening Covers sections on model systems and functional studies, imaging-based approaches and emerging studies Chapters are written by experts in the field Cutting-edge material

The Biology and Management of Lobsters-J. Stanley Cobb 2012-12-02 This two-volume work presents a summary and review of the current state of lobster biology, ecology, physiology, behavior, and management. It emphasizes the biology of clawed lobsters (Nephropidae) and spiny lobsters (Palinuridae), with attention also given to slipper lobsters (Scyllaridae) and coral lobsters (Synaxidae). The first chapter of Volume 1 provides an overview of the general aspects of lobster biology that serves as an introduction for readers of both volumes. Subsequent chapters examine the topics of growth, neurobiology, reproduction, nutrition, pathology, social behavior, and migration patterns. The chapters in Volume II consider the ecology, population dynamics, fishery biology, and aquaculture of spiny and clawed lobsters. The topics selected in both volumes represent areas of current research whose findings have not been previously synthesized into a coherent form. An important feature of these volumes is the emphasis on the interaction between biology and management and culture. Many of the contributors have done research in both applied and basic biology and can articulate both points of view. The interaction between basic and applied research is of fundamental importance in these volumes in which

management aspects of the research have been integrated with the basic biology of lobsters. The Biology and Management of Lobsterswill be of interest to crustacean biologists, marine biologists and ecologists, zoologists, physiologists, animal behavior researchers, aquaculturalists, fisheries biologists and managers of fisheries, neurobiologists, pathologists, and food scientists.

Bark Beetles-Fernando E. Vega 2014-12-29 Bark Beetles: Biology and Ecology of Native and Invasive Species provides a thorough discussion of these economically important pests of coniferous and broadleaf trees and their importance in agriculture. It is the first book in the market solely dedicated to this important group of insects, and contains 15 chapters on natural history and ecology, morphology, taxonomy and phylogenetics, evolution and diversity, population dynamics, resistance, symbiotic associations, natural enemies, climate change, management strategies, economics, and politics, with some chapters exclusively devoted to some of the most economically important bark beetle genera, including Dendroctonus, Ips, Tomicus, Hypothenemus, and Scolytus. This text is ideal for entomology and forestry courses, and is aimed at scientists, faculty members, forest managers, practitioners of biological control of insect pests, mycologists interested in bark beetle-fungal associations, and students in the disciplines of entomology, ecology, and forestry. Provides the only synthesis of the literature on bark beetles Features chapters exclusively devoted to some of the most economically important bark beetle genera, such as Dendroctonus, Ips, Tomicus, Hypothenemus, and Scolytus Includes copious color illustrations and photographs that further enhance the content

Microtubules: in vivo- 2010-09-24 Microtubules: in vivo includes chapters by experts around the world on many aspects of microtubule imaging in living and fixed cells; assays to study microtubule function in a wide array of model organisms and cultured cells; high resolution approaches to study of the cytoskeleton. The authors share their years of experience, outlining potential pitfalls and critical factors to consider in experimental design, experimental implementation and data interpretation. Includes chapters by experts around the world on many aspects of microtubule imaging in living and fixed cells; assays to study microtubule function in a wide array of model organisms and cultured cells; high resolution approaches to study of the cytoskeleton The authors share their years of experience, outlining potential pitfalls and critical factors to consider in experimental design, experimental implementation and data interpretation

Lab Dynamics-Carl M. Cohen 2006-10-01 "Lab Dynamics is a book about the challenges to doing science and dealing with the individuals involved, including oneself. The authors, a scientist and a psychotherapist, draw on principles of group and behavioral psychology but speak to scientists in their own language about their own experiences. They offer in-depth, practical advice, real-life examples, and exercises tailored to scientific and technical workplaces on topics as diverse as conflict resolution, negotiation, dealing with supervision, working with competing peers, and making the transition from academia to industry." "This is a uniquely valuable contribution to the scientific literature, on a subject of direct importance to lab heads, postdocs, and students. It is also required reading for senior staff concerned about improving efficiency and effectiveness in academic and industrial research."--BOOK JACKET

Biological Complexity and the Dynamics of Life Processes-J. Ricard 1999-11-01 The aim of this book is to show how supramolecular complexity of cell organization can dramatically alter the functions of individual macromolecules within a cell. The emergence of new functions which appear as a consequence of supramolecular complexity, is explained in terms of physical chemistry. The book is interdisciplinary, at the border between cell biochemistry, physics and physical chemistry. This interdisciplinarity does not result in the use of physical techniques but from the use of physical concepts to study biological problems. In the domain of complexity studies, most works are purely theoretical or based on computer simulation. The present book is partly theoretical, partly experimental and theory is always based on experimental results. Moreover, the book encompasses in a unified manner the dynamic aspects of many different biological fields ranging from dynamics to pattern emergence in a young embryo. The volume puts emphasis on dynamic physical studies of biological events. It also develops, in a unified perspective, this new interdisciplinary approach of various important problems of cell biology and chemistry, ranging from enzyme dynamics to pattern formation during embryo development, thus paving the way to what may become a central issue of future biology.

Actin Microfilament Dynamics in Cell and Parasite Motility-Julie Anne Theriot 1993

Kinetics and Dynamics-Piotr Paneth 2010-08-03 "Kinetics and Dynamics" on molecular modeling of dynamic processes opens with an introductory overview before discussing approaches to reactivity of small systems in the gas phase. Then it examines studies of systems of increasing complexity up to the dynamics of DNA. This title has interdisciplinary character presenting wherever possible an interplay between the theory and the experiment. It provides basic information as well as the details of theory and examples of its application to experimentalists and theoreticians interested in modeling of dynamic processes in chemical and biochemical systems. All contributing authors are renowned experts in their fields and topics covered in this volume represent the forefront of today's science.

Nonlinear Dynamics and Chaos-Steven H. Strogatz 2018-05-04 This textbook is aimed at newcomers to nonlinear dynamics and chaos, especially students taking a first course in the subject. The presentation stresses analytical methods, concrete examples, and geometric intuition. The theory is developed systematically, starting with first-order differential equations and their bifurcations, followed by phase plane analysis, limit cycles and their bifurcations, and culminating with the Lorenz equations, chaos, iterated maps, period doubling, renormalization, fractals, and strange attractors.

X-Ray Free Electron Lasers-Uwe Bergman 2017-08-15 Edited by pioneers in this exciting field, and featuring contributions from leading researchers, this book discusses the principles and applications of XFELs.

The Dynamics of Radicalization-Eitan Y. Alimi 2015-04-01 "The book comparatively investigates the processes of radicalization, focusing on questions of how and when such processes unfold, rather than on why they happen in the first place. Alimi, Bosi, and Demetriou argue that processes of radicalization develop primarily through the interplay of three specific mechanisms: "competition for power" among movement actors; "threat/opportunity spirals" between the movement and its political environment; and "outbidding" between movement actors and state security forces. Each arena or mechanism affects and is affected by the other two, creating a multilayered pathway of radicalization. Using the "most different case" logic, the authors argue their theory through three case studies: the Red Brigades in Italy (1968-1980), the Greek Cypriot Enosis-EOKA (1945-1960), and the Al Qaeda/Sunni-led Salafi Transnational Jihad Movement (1984-2001). Without losing sight of the significant differences between the cases, or of the way in which they influence the particular sequence of the process, the book provides an empirically proven and widely applicable analytic framework for understanding how political processes and different contexts drive radicalization"--

Population Dynamics for Conservation-Louis W. Botsford 2019-09-26 The management and conservation of natural populations relies heavily on concepts and results generated from models of population dynamics. Yet this is the first book to present a unified and coherent explanation of the underlying theory. This novel text begins with a consideration of what makes a good state variable, progressing from the simplest models (those with a single variable such as abundance or biomass) to more complex models with other key variables of population structure (including age, size, life history stage, and space). Throughout the book, attention is paid to concepts such as population variability, population stability, population viability/persistence, and harvest yield. Later chapters address specific applications to conservation such as recovery planning for species at risk, fishery management, and the spatial management of marine resources. Population Dynamics for Conservation is suitable for graduate-level students. It will also be valuable to academic and applied researchers in population biology. This overview of population dynamic theory can serve to further their population research, as well as to improve their understanding of population management.

Computational Tools for Chemical Biology-Sonsoles Martín-Santamaría 2017-11-01

Molecular Biology-Jordanka Zlatanova 2015-11-23 Recipient of the CHOICE Outstanding Academic Title (OAT) Award.Molecular Biology: Structure and Dynamics of Genomes and Proteomes illustrates the essential principles behind the transmission and expression of genetic information at the level of DNA, RNA, and proteins.This textbook emphasizes the experimental basis of discovery and the most recent a

Pediatric and Adolescent Diabetes Mellitus-Stuart J. Brink 1987

Herpetology-Laurie J. Vitt 2012-12-02 Herpetology has always been one of the most exciting disciplines of zoology. During the past few years the field has continued to grow, yet it has been plagued by scarcity of comprehensive, up-to-date textbooks containing the most important developments. This timely book fills that void. Through skillful synthesis, the author summarizes the diversity in the biology of living amphibians and reptiles and describes the breadth of current herpetological research. Topics covered include the evolution, classification, development, reproduction, population, and environmental issues surrounding the study of amphibians and reptiles. Designed as an advanced undergraduate textbook, Herpetology is a valuable resource for students, practitioners, and interested amateurs alike. Provides an incisive survey and much needed update of the field Emphasizes the biological diversity among amphibians and reptiles Details the most recent research findings, citing ke

Nonlinear Dynamics of Interacting Populations-A. D. Bazykin 1998 This book contains a systematic study of ecological communities of two or three interacting

populations. Starting from the Lotka-Volterra system, various regulating factors are considered, such as rates of birth and death, predation and competition. The different factors can have a stabilizing or a destabilizing effect on the community, and their interplay leads to increasingly complicated behavior. Studying and understanding this path to greater dynamical complexity of ecological systems constitutes the backbone of this book. On the mathematical side, the tool of choice is the qualitative theory of dynamical systems — most importantly bifurcation theory, which describes the dependence of a system on the parameters. This approach allows one to find general patterns of behavior that are expected to be observed in ecological models. Of special interest is the reaction of a given model to disturbances of its present state, as well as to changes in the external conditions. This leads to the general idea of “dangerous boundaries” in the state and parameter space of an ecological system. The study of these boundaries allows one to analyze and predict qualitative and often sudden changes of the dynamics — a much-needed tool, given the increasing antropogenic load on the biosphere.As a spin-off from this approach, the book can be used as a guided tour of bifurcation theory from the viewpoint of application. The interested reader will find a wealth of intriguing examples of how known bifurcations occur in applications. The book can in fact be seen as bridging the gap between mathematical biology and bifurcation theory.

Neutron Scattering - Fundamentals-Mark R. Johnson 2013-11-22 The aim of this chapter is to show how inelastic and quasielastic neutron scattering can be used to study dynamics in a range of materials varying from simple model systems to complex systems that are close to those used in technologically important applications. After a brief overview of the theoretical and instrumental concepts, we use examples to show how different types of atomic and molecular motions can be understood using neutron scattering experiments, frequently in combination with atomistic modeling methods. We cover aspects of physics, chemistry, biology, and materials science, but with the main focus on functional materials.