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Advances in Turbulence VII Uriel Frisch 2012-12-06 Advances in Turbulence VII contains an overview of the state of turbulence research with some bias towards work done in Europe. It represents an almost complete collection of the invited and contributed papers delivered at the Seventh European Turbulence Conference, sponsored by EUROMECH and ERCOFTAC and organized by the Observatoire de la C te d'Azur. New high-Reynolds number experiments combined with new techniques of imaging, non-intrusive probing, processing and simulation provide high-quality data which put significant constraints on possible theories. For the first time, it has been shown, for a class of passive scalar problems, why dimensional analysis sometimes gives the wrong answers and how anomalous intermittency corrections can be calculated from first principles. The volume is thus geared towards specialists in the area of flow turbulence who could not attend the conference as well as anybody interested in this rapidly moving field.
Fundamentals of Nuclear Pharmacy Gopal B. Saha 2013-06-29 A new edition of a book is warranted when the book is successful and there are many new developments in the related discipline. Both have occurred for this book during the past 7 years since its second edition. The growth and development in nuclear pharmacy and radiopharmaceutical chemistry along with the continued success of the book have convinced us to update the book; hence this third edition. This book is a ramification of my nuclear pharmacy courses offered to pharmacy students specializing in nuclear pharmacy, nuclear medicine resi dents, and nuclear medicine technology students. The book is written in an integrated form from the basic concept of atomic structure to the practical clinical uses of radiopharmaceuticals. It serves both as a textbook on nu clear pharmacy for pharmacy students and nuclear medicine technologists, and as a useful reference book for many professionals related to nuclear medicine, such as nuclear medicine physicians and radiologists. The book contains 12 chapters. Each chapter is written as comprehen sively as possible based on my personal experience and understanding. At the end of each chapter, a section of pertinent questions and problems and so me suggested reading materials are included. I have made justifiably many additions and deletions as weIl as some reorganization in this edition. Chapter 3 is entirely dedicated to instru ments for radiation detection and measurement, including brief description of gas detectors, gamma-detecting instruments, and tomographic scanners.
Oxford Textbook of Rheumatology Philip Conaghan 2013-10 A strong clinical emphasis is present throughout this volume from the first section of commonly presenting problems through to the section addressing problems shared with a range of other clinical sub-specialties.
Quantum Monte Carlo Methods in Condensed Matter Physics Masuo Suzuki 1993 This book reviews recent developments of quantum Monte Carlo methods and some remarkable applications to interacting quantum spin systems and strongly correlated electron systems. It contains twenty-two papers by thirty authors. Some of the features are as follows. The first paper gives the foundations of the standard quantum Monte Carlo method, including some recent results on higher-order decompositions of exponential operators and ordered exponentials. The second paper presents a general review of quantum Monte Carlo methods used in the present book. One of the most challenging problems in the field of quantum

Monte Carlo techniques, the negative-sign problem, is also discussed and new methods proposed to partially overcome it. In addition, low-dimensional quantum spin systems are studied. Some interesting applications of quantum Monte Carlo methods to fermion systems are also presented to investigate the role of strong correlations and fluctuations of electrons and to clarify the mechanism of high-c superconductivity. Not only thermal properties but also quantum-mechanical ground-state properties have been studied by the projection technique using auxiliary fields. Further, the Haldane gap is confirmed by numerical calculations. Active researchers in the forefront of condensed matter physics as well as young graduate students who want to start learning the quantum Monte Carlo methods will find this book useful.

Fundamentals of Electric Propulsion Dan M. Goebel 2008-12-22 Throughout most of the twentieth century, electric propulsion was considered the technology of the future. Now, the future has arrived. This important new book explains the fundamentals of electric propulsion for spacecraft and describes in detail the physics and characteristics of the two major electric thrusters in use today, ion and Hall thrusters. The authors provide an introduction to plasma physics in order to allow readers to understand the models and derivations used in determining electric thruster performance. They then go on to present detailed explanations of: Thruster principles Ion thruster plasma generators and accelerator grids Hollow cathodes Hall thrusters Ion and Hall thruster plumes Flight ion and Hall thrusters Based largely on research and development performed at the Jet Propulsion Laboratory (JPL) and complemented with scores of tables, figures, homework problems, and references, Fundamentals of Electric Propulsion: Ion and Hall Thrusters is an indispensable textbook for advanced undergraduate and graduate students who are preparing to enter the aerospace industry. It also serves as an equally valuable resource for professional engineers already at work in the field.

An Introduction to Dynamics of Colloids J.K.G. Dhont 1996-05-20 One of the few textbooks in the field, this volume deals with several aspects of the dynamics of colloids. A self-contained treatise, it fills the gap between research literature and existing books for graduate students and researchers. For readers with a background in chemistry, the first chapter contains a section on frequently used mathematical techniques, as well as statistical mechanics. Some of the topics covered include: • diffusion of free particles on the basis of the Langevin equation •the separation of time, length and angular scales; • the fundamental Fokker-Planck and Smoluchowski equations derived for interacting particles • friction of spheres and rods, and hydrodynamic interaction of spheres (including three body interactions) • diffusion, sedimentation, critical phenomena and phase separation kinetics • experimental light scattering results. For universities and research departments in industry this textbook makes vital reading.

Intensification of Liquid–Liquid Processes Laurence R. Weatherley 2020-04-16 Explore and review novel techniques for intensifying transport and reaction in liquid-liquid and related systems with this essential toolkit. Topics include discussion of the principles of process intensification, the nexus between process intensification and sustainable engineering, and the fundamentals of liquid-liquid contacting, from an expert with over forty-five years' experience in the field. Providing promising directions for investment and for new research in process intensification, in addition to a unique review of the fundamentals of the topic, this book is the perfect guide for senior undergraduate students, graduate students, developers, and research staff in chemical engineering and biochemical engineering.

Nanoelectronics Avik Ghosh 2016-09-29 This book is aimed at senior undergraduates, graduate students and researchers interested in quantitative understanding and modeling of nanomaterial and device physics. With the rapid slow-down of semiconductor scaling that drove information technology for decades, there is a pressing need to understand and model electron flow at its fundamental molecular limits. The purpose of this book is to enable such a deconstruction needed to design the next generation memory, logic, sensor and communication elements. Through numerous case studies and topical examples relating to emerging technology, this book connects 'top down' classical device physics taught in electrical engineering classes with 'bottom up' quantum and many-body transport physics taught in physics and chemistry. The book assumes no more than a nodding acquaintance with quantum mechanics, in addition to knowledge of freshman level mathematics. Segments of this book are useful as a textbook for a course in nano-electronics.

Sharp Focusing of Laser Light Victor V. Kotlyar 2019-10-25 Readers will learn in which ways light can be "confined" within a subwavelength region smaller than half a wavelength. Strictly within the focal spot, all degrees of freedom of light interact and manifest themselves in a dramatic way. The size and shape of the focal spot and the magnitude of side-lobes depend on the polarization state alongside phase and amplitude distributions of a light beam. Readers will learn techniques in which inhomogeneously (i.e., azimuthally and radially) polarized optical beams can be focused. In sharp focus, exotic phenomena can occur, including the negative propagation of light and a toroidal optical flow. Throughout the book, the numerical simulation is performed using the rigorous solution of Maxwell's equations based on a Finite-Difference Time-Domain (FDTD) approach, which makes the results of modeling highly reliable. The photonic components, including optical metasurfaces, discussed in the book have

been implemented using state-of-the-art techniques of electron beam writing and reactive ion-beam etching of microrelief. Two chapters are concerned with photonics hot spots, which deal with the control of light by means of optical metasurfaces and the generation of an energy backflow in the region of sharp focus of a laser beam. Another hot topic is diffractive polarization converters implemented as subwavelength diffraction gratings to convert polarization of light. By way of illustration, such converters are shown to perform linear-to-radial or linear-to-azimuthal polarization conversion. The book describes advanced photonic components fabricated by the authors to perform sharp focusing of light, including binary zone plates, binary axicons, a planar photonic crystal lens, diffraction polarization converters, and metalenses. This book is a must-have for individuals and institutions studying cutting edge optics.

Introduction to Modeling and Control of Internal Combustion Engine Systems Lino Guzzella 2013-03-14 Internal combustion engines still have a potential for substantial improvements, particularly with regard to fuel efficiency and environmental compatibility. These goals can be achieved with help of control systems. Modeling and Control of Internal Combustion Engines (ICE) addresses these issues by offering an introduction to cost-effective model-based control system design for ICE. The primary emphasis is put on the ICE and its auxiliary devices. Mathematical models for these processes are developed in the text and selected feedforward and feedback control problems are discussed. The appendix contains a summary of the most important controller analysis and design methods, and a case study that analyzes a simplified idle-speed control problem. The book is written for students interested in the design of classical and novel ICE control systems.

An Invitation to Mathematical Physics and Its History Jont Allen 2020-09-22 This state of the art book takes an applications based approach to teaching mathematics to engineering and applied sciences students. The book lays emphasis on associating mathematical concepts with their physical counterparts, training students of engineering in mathematics to help them learn how things work. The book covers the concepts of number systems, algebra equations and calculus through discussions on mathematics and physics, discussing their intertwined history in a chronological order. The book includes examples, homework problems, and exercises. This book can be used to teach a first course in engineering mathematics or as a refresher on basic mathematical physics. Besides serving as core textbook, this book will also appeal to undergraduate students with cross-disciplinary interests as a supplementary text or reader.

Models of Quantum Matter Hans-Peter Eckle 2019-07-29 An important task of theoretical quantum physics is the building of idealized mathematical models to describe the properties of quantum matter. This book provides an introduction to the arguably most important method for obtaining exact results for strongly interacting models of quantum matter - the Bethe ansatz. It introduces and discusses the physical concepts and mathematical tools used to construct realistic models for a variety of different fields, including condensed matter physics and quantum optics. The various forms of the Bethe ansatz - algebraic, coordinate, multicomponent, and thermodynamic Bethe ansatz, and Bethe ansatz for finite systems - are then explained in depth and employed to find exact solutions for the physical properties of the integrable forms of strongly interacting quantum systems. The Bethe ansatz is one of the very few methodologies which can calculate physical properties non-perturbatively. Arguably, it is the only such method we have which is exact. This means, once the model has been set up, no further approximations or assumptions are necessary, and the relevant physical properties of the model can be computed exactly. Furthermore, an infinite set of conserved quantities can be obtained. The quantum mechanical model under consideration is fully integrable. This makes the search for quantum models which are amenable to an exact solution by the Bethe ansatz, and which are quantum integrable, so important and rewarding. The exact solution will provide benchmarks for other models, which do not admit an exact solution. Bethe ansatz techniques provide valuable insight into the physics of strongly correlated quantum matter.

Open-Channel Microfluidics Jean Berthier 2019-09-04 Open microfluidics, the study of microflows having a boundary with surrounding air, encompasses different aspects such as paper or thread-based microfluidics, droplet microfluidics and open-channel microfluidics. Open-channel microflow is a flow at the micro-scale, guided by solid structures, and having at least a free boundary (with air or vapor) other than the advancing meniscus. This book is devoted to the study of open-channel microfluidics which (contrary to paper or thread or droplet microfluidics) is still very sparsely documented, but bears many new applications in biology, biotechnology, medicine, material and space sciences. Capillarity being the principal force triggering an open microflow, the principles of capillarity are first recalled. The onset of open-channel microflow is next analyzed and the fundamental notion of generalized Cassie angle (the apparent contact angle which accounts for the presence of air) is presented. The theory of the dynamics of open-channel microflows is then developed, using the notion of averaged friction length which accounts for the presence of air along the boundaries of the flow domain. Different channel morphologies are studied and geometrical features such as valves and capillary pumps are examined. An introduction to two-phase open-channel microflows is also presented showing that immiscible plugs can be transported by an open-channel flow. Finally, a selection of interesting applications in the domains of space, materials, medicine

and biology is presented, showing the potentialities of open-channel microfluidics.

Tensor Network Contractions Shi-Ju Ran 2020-01-01 Tensor network is a fundamental mathematical tool with a huge range of applications in physics, such as condensed matter physics, statistic physics, high energy physics, and quantum information sciences. This open access book aims to explain the tensor network contraction approaches in a systematic way, from the basic definitions to the important applications. This book is also useful to those who apply tensor networks in areas beyond physics, such as machine learning and the big-data analysis. Tensor network originates from the numerical renormalization group approach proposed by K.G. Wilson in 1975. Through a rapid development in the last two decades, tensor network has become a powerful numerical tool that can efficiently simulate a wide range of scientific problems, with particular success in quantum many-body physics. Varieties of tensor network algorithms have been proposed for different problems. However, the connections among different algorithms are not well discussed or reviewed. To fill this gap, this book explains the fundamental concepts and basic ideas that connect and/or unify different strategies of the tensor network contraction algorithms. In addition, some of the recent progresses in dealing with tensor decomposition techniques and quantum simulations are also represented in this book to help the readers to better understand tensor network. This open access book is intended for graduated students, but can also be used as a professional book for researchers in the related fields. To understand most of the contents in the book, only basic knowledge of quantum mechanics and linear algebra is required. In order to fully understand some advanced parts, the reader will need to be familiar with notion of condensed matter physics and quantum information, that however are not necessary to understand the main parts of the book. This book is a good source for non-specialists on quantum physics to understand tensor network algorithms and the related mathematics.

Melt Rheology and Its Role in Plastics Processing K. Wissbrun 2013-11-27 This book is designed to fulfill a dual role. On the one hand it provides a description of the rheological behavior of molten poly mers. On the other, it presents the role of rheology in melt processing operations. The account of rheology emphasises the underlying principles and presents results, but not detailed deriva tions of equations. The processing operations are described qualita tively, and wherever possible the role of rheology is discussed quantitatively. Little emphasis is given to non-rheological aspects of processes, for example, the design of machinery. The audience for which the book is intended is also dual in It includes scientists and engineers whose work in the nature. plastics industry requires some knowledge of aspects of rheology. Examples are the polymer synthetic chemist who is concerned with how a change in molecular weight will affect the melt viscosity and the extrusion engineer who needs to know the effects of a change in molecular weight distribution that might result from thermal degra dation. The audience also includes post-graduate students in polymer science and engineering who wish to acquire a more extensive background in rheology and perhaps become specialists in this area. Especially for the latter audience, references are given to more detailed accounts of specialized topics, such as constitutive relations and process simulations. Thus, the book could serve as a textbook for a graduate level course in polymer rheology, and it has been used for this purpose.

Reliability Physics and Engineering J. W. McPherson 2013-06-03 "Reliability Physics and Engineering" provides critically important information for designing and building reliable cost-effective products. The textbook contains numerous example problems with solutions. Included at the end of each chapter are exercise problems and answers. "Reliability Physics and Engineering" is a useful resource for students, engineers, and materials scientists.

The Demon in the Machine Paul Davies 2019-01-31 'A gripping new drama in science ... if you want to understand how the concept of life is changing, read this' Professor Andrew Briggs, University of Oxford When Darwin set out to explain the origin of species, he made no attempt to answer the deeper question: what is life? For generations, scientists have struggled to make sense of this fundamental question. Life really does look like magic: even a humble bacterium accomplishes things so dazzling that no human engineer can match it. And yet, huge advances in molecular biology over the past few decades have served only to deepen the mystery. So can life be explained by known physics and chemistry, or do we need something fundamentally new? In this penetrating and wide-ranging new analysis, world-renowned physicist and science communicator Paul Davies searches for answers in a field so new and fast-moving that it lacks a name, a domain where computing, chemistry, quantum physics and nanotechnology intersect. At the heart of these diverse fields, Davies explains, is the concept of information: a quantity with the power to unify biology with physics, transform technology and medicine, and even to illuminate the age-old question of whether we are alone in the universe. From life's murky origins to the microscopic engines that run the cells of our bodies, The Demon in the Machine is a breath-taking journey across the landscape of physics, biology, logic and computing. Weaving together cancer and consciousness, two-headed worms and bird navigation, Davies reveals how biological organisms garner and process information to conjure order out of chaos, opening a window on the secret of life itself.

Recommended Minimum Requirements for Plumbing United States. Dept. of commerce. Building code committee 1929

Vascular Smooth Muscle Chi-Ming Hai 2016-10-12 This book presents key

concepts in the structure and function of vascular smooth muscle cells in health and disease. Supplemental reading may be drawn from the extensive references listed at the end of each chapter. Vascular smooth muscle cell is the major cell type in blood vessels. Dysfunction of vascular smooth muscle cells is an important cause of vascular diseases, for example, atherosclerosis, hypertension, and circulatory shock. Vascular smooth muscle cells are phenotypically plastic, capable of switching between two major phenotypes — contractile/differentiated phenotype and invasive/proliferative phenotype in response to environmental clues. Chapter 1 introduces the major areas of research presented in this monograph. Chapters 2 to 4 address the structure and function of the contractile/differentiated phenotype of vascular smooth muscle cell. Chapters 5 and 6 address the developmental basis of vascular smooth muscle cell phenotype and structure and function of podosomes (invasive organelles) in the invasive/proliferative phenotype of vascular smooth muscle cell. Chapters 7 to 9 address the role of vascular smooth muscle cell dysfunction in vascular diseases — atherosclerosis, hypertension, and circulatory shock. Contents:Introduction (Chi-Ming Hai)Structure of Differentiated/Contractile Vascular Smooth Muscle Cells (Thomas J Eddinger)Vascular Structure and Function (Paul H Ratz)Actin Filament Dynamics During Vascular Smooth Muscle Contraction (William C Cole and Michael P Walsh)Developmental Basis of Vascular Smooth Muscle Cell Phenotypes (Christine Cheung and B C Narmada)Regulation of Podosomes in Vascular Smooth Muscle Cell Invasion of the Extracellular Matrix (Alan Mak)Vascular Smooth Muscle Cell Proliferation and Invasion in Atherosclerosis (Chi-Ming Hai)The Role of Non-Coding RNA in the Control of Vascular Contractility and Disease (C J Nicholson and K G Morgan)Vascular Smooth Muscle Cells as Therapeutic Target for the Treatment of Circulatory Shock (Liangming Liu, Tao Li and Chengyang Duan) Readership: This book will be a useful reference for graduate students, post-doctoral fellows, and scientists who work on vascular biology, as well as physicians who work on vascular medicine.

The Physics of Solids John B. Ketterson 2016-05-19 This comprehensive text covers the basic physics of the solid state starting at an elementary level suitable for undergraduates but then advancing, in stages, to a graduate and advanced graduate level. In addition to treating the fundamental elastic, electrical, thermal, magnetic, structural, electronic, transport, optical, mechanical and compositional properties, we also discuss topics like superfluidity and superconductivity along with special topics such as strongly correlated systems, high-temperature superconductors, the quantum Hall effects, and graphene. Particular emphasis is given to so-called first principles calculations utilizing modern density functional theory which for many systems now allow accurate calculations of the electronic, magnetic, and thermal properties.

National 5 Biology with Answers James Torrance 2013-07-26 A full course textbook for the new National 5 Biology syllabus, endorsed by SQA! This book is designed to act as a valuable resource for pupils studying National 5 Biology. It provides a core text which adheres closely to the SQA syllabus, with each section of the book matching a unit of the syllabus, and each chapter corresponding to a content area. It is an ideal - and comprehensive - teaching and learning resource for National 5 Biology. In addition to the core text, the book contains a variety of special features: Learning Activities, Testing Your Knowledge, What You Should Know, and Applying Knowledge and Skills. - The only textbook for the National 5 Biology syllabus offered by SQA, as examined 2014 onwards - Bestselling author team, with extremely high reputation for Scottish Biology titles - Full colour presentation and motivating text design to encourage student enthusiasm

Who We Are and How We Got Here David Reich 2018-03-27 David Reich describes how the revolution in the ability to sequence ancient DNA has changed our understanding of the deep human past. This book tells the emerging story of our often surprising ancestry - the extraordinary ancient migrations and mixtures of populations that have made us who we are.

Primary Angioplasty Timothy J Watson 2018-07-13 This book is open access under a CC BY 4.0 license. This quick-reference handbook offers a concise and practical review of key aspects of the treatment of ST-segment elevation myocardial infarction (STEMI) in the era of primary percutaneous coronary intervention (PPCI). In the context of STEMI, PPCI is the preferred mode of emergency revascularization. Access to PPCI is rapidly increasing and is now routinely practiced in both general and specialist hospitals and there has been a recent emphasis on developing STEMI networks to enhance and expedite the referral pathway. This coupled with concurrent developments to enhance the safety and efficacy of the PPCI procedure has heralded an era where STEMI interventions are increasingly considered an important subspecialty within interventional cardiology. Written by leading cardiologists who have been instrumental in the adoption of PPCI in their respective institutions, the book provides junior and senior cardiologists alike with insightful and thought-provoking tips and tricks to enhance the success of PPCI procedures, which may in turn translate into direct improvements in outcomes. The book is also relevant for healthcare providers and emergency department physicians.

CPO Focus on Life Science CPO Science (Firm) 2007

Pericardial Disease J. Soler-Soler 2012-12-06 In November 1986, I was invited

to attend a symposium held in Barcelona on Diseases of the Pericardium. The course was directed by Dr. J. Soler-Soler, director of Cardiology at Hospital General Vall d'Hebron in Barcelona. During my brief but delightful visit to this institution, my appreciation of the depth and breadth of study into pericardial diseases, carried out by Dr. Soler and his group, grew into the conviction that these clinical investigators have accumulated a wealth of information concerning pericardial diseases, and that investigators and clinicians practicing in English speaking countries would greatly profit from ready access to the results of the clinical investiga tions into pericardial disease carried out in Barcelona. The proceedings of the Barcelona conference were published in a beauti fully executed volume in the Spanish language edited by Dr. Soler and pro duced by Ediciones Doyma. Because I believe that this work should be brought to the attention of the English speaking scientific and clinical com munities, I encouraged Dr. Soler to have the book translated into English. I knew that this task could be accomplished and that the book would be trans lated into good English without change of its content. My confidence was based upon a translation of my own book, The Pericardium, into Spanish undertaken by Dr. Permanyer, who is a contributor and co-editor of the pre sent volume.

Water Encyclopedia, Surface and Agricultural Water Jay H. Lehr 2005-06-01 Maximizing the use of our visible surface supplies in light of their greatest need in agriculture presents an enormous challenge throughout the world. New techniques in agricultural applications to preserve resources and increase yields are featured. Dams, lakes, and hydraulic features of surface water systems are amply covered, along with the importance of storm water management to growing communities.

Lecture Notes on Electron Correlation and Magnetism Patrik Fazekas 1999 Readership: Graduate students and researchers in condensed matter physics.

Controlled Fusion and Plasma Physics Kenro Miyamoto 2006-10-23 Resulting from ongoing, international research into fusion processes, the International Tokamak Experimental Reactor (ITER) is a major step in the quest for a new energy source.The first graduate-level text to cover the details of ITER, Controlled Fusion and Plasma Physics introduces various aspects and issues of recent fusion research activities through the shortest access path. The distinguished author breaks down the topic by first dealing with fusion and then concentrating on the more complex subject of plasma physics. The book begins with the basics of controlled fusion research, followed by discussions on tokamaks, reversed field pinch (RFP), stellarators, and mirrors. The text then explores ideal magnetohydrodynamic (MHD) instabilities, resistive instabilities, neoclassical tearing mode, resistive wall mode, the Boltzmann equation, the Vlasov equation, and Landau damping. After covering dielectric tensors of cold and hot plasmas, the author discusses the physical mechanisms of wave heating and noninductive current drive. The book concludes with an examination of the challenging issues of plasma transport by turbulence, such as magnetic fluctuation and zonal flow. Controlled Fusion and Plasma Physics clearly and thoroughly promotes intuitive understanding of the developments of the principal fusion programs and the relevant fundamental and advanced plasma physics associated with each program.

Ecological and Environmental Physiology of Mammals Philip C. Withers 2016-09-15 Mammals are the so-called "pinnacle" group of vertebrates, successfully colonising virtually all terrestrial environments as well as the air (bats) and sea (especially pinnipeds and cetaceans). How mammals function and survive in these diverse environments has long fascinated mammologists, comparative physiologists and ecologists. Ecological and Environmental Physiology of Mammals explores the physiological mechanisms and evolutionary necessities that have made the spectacular adaptation of mammals possible. It summarises our current knowledge of the complex and sophisticated physiological approaches that mammals have for survival in a wide variety of ecological and environmental contexts: terrestrial, aerial, and aquatic. The authors have a strong comparative and quantitative focus in their broad approach to exploring mammal ecophysiology. As with other books in the Ecological and Environmental Physiology Series, the emphasis is on the unique physiological characteristics of mammals, their adaptations to extreme environments, and current experimental techniques and future research directions are also considered. This accessible text is suitable for graduate level students and researchers in the fields of mammalian comparative physiology and physiological ecology, including specialist courses in mammal ecology. It will also be of value and use to the many professional mammologists requiring a concise overview of the topic.

Best Practices Handbook for the Collection and Use of Solar Resource Data for Solar Energy Applications Manajit Sengupta 2021

Chemical Engineering Design Gavin Towler 2012-01-25 Chemical Engineering Design, Second Edition, deals with the application of chemical engineering principles to the design of chemical processes and equipment. Revised throughout, this edition has been specifically developed for the U.S. market. It provides the latest US codes and standards, including API, ASME and ISA design codes and ANSI standards. It contains new discussions of conceptual plant design, flowsheet development, and revamp design; extended coverage of capital cost estimation, process costing, and economics; and new chapters on equipment selection, reactor design, and solids handling processes. A rigorous pedagogy assists learning, with detailed worked examples, end of chapter exercises, plus

supporting data, and Excel spreadsheet calculations, plus over 150 Patent References for downloading from the companion website. Extensive instructor resources, including 1170 lecture slides and a fully worked solutions manual are available to adopting instructors. This text is designed for chemical and biochemical engineering students (senior undergraduate year, plus appropriate for capstone design courses where taken, plus graduates) and lecturers/tutors, and professionals in industry (chemical process, biochemical, pharmaceutical, petrochemical sectors). New to this edition: Revised organization into Part I: Process Design, and Part II: Plant Design. The broad themes of Part I are flowsheet development, economic analysis, safety and environmental impact and optimization. Part II contains chapters on equipment design and selection that can be used as supplements to a lecture course or as essential references for students or practicing engineers working on design projects. New discussion of conceptual plant design, flowsheet development and revamp design Significantly increased coverage of capital cost estimation, process costing and economics New chapters on equipment selection, reactor design and solids handling processes New sections on fermentation, adsorption, membrane separations, ion exchange and chromatography Increased coverage of batch processing, food, pharmaceutical and biological processes All equipment chapters in Part II revised and updated with current information Updated throughout for latest US codes and standards, including API, ASME and ISA design codes and ANSI standards Additional worked examples and homework problems The most complete and up to date coverage of equipment selection 108 realistic commercial design projects from diverse industries A rigorous pedagogy assists learning, with detailed worked examples, end of chapter exercises, plus supporting data and Excel spreadsheet calculations plus over 150 Patent References, for downloading from the companion website Extensive instructor resources: 1170 lecture slides plus fully worked solutions manual available to adopting instructors

Polymer Solutions Iwao Teraoka 2004-04-07 Polymer Solutions: An Introduction to Physical Properties offers a fresh, inclusive approach to teaching the fundamentals of physical polymer science. Students, instructors, and professionals in polymer chemistry, analytical chemistry, organic chemistry, engineering, materials, and textiles will find Iwao Teraoka's text at once accessible and highly detailed in its treatment of the properties of polymers in the solution phase. Teraoka's purpose in writing Polymer Solutions is twofold: to familiarize the advanced undergraduate and beginning graduate student with basic concepts, theories, models, and experimental techniques for polymer solutions; and to provide a reference for researchers working in the area of polymer solutions as well as those in charge of chromatographic characterization of polymers. The author's incorporation of recent advances in the instrumentation of size-exclusion chromatography, the method by which polymers are analyzed, renders the text particularly topical. Subjects discussed include: Real, ideal, Gaussian, semirigid, and branched polymer chains Polymer solutions and thermodynamics Static light scattering of a polymer solution Dynamic light scattering and diffusion of polymers Dynamics of dilute and semidilute polymer solutions Study questions at the end of each chapter not only provide students with the opportunity to test their understanding, but also introduce topics relevant to polymer solutions not included in the main text. With over 250 geometrical model diagrams, Polymer Solutions is a necessary reference for students and for scientists pursuing a broader understanding of polymers.

Regulation of Coronary Blood Flow Michitoshi Inoue 2013-11-09 Research centering on blood flow in the heart continues to hold an important position, especially since a better understanding of the subject may help reduce the incidence of coronary arterial disease and heart attacks. This book summarizes recent advances in the field; it is the product of fruitful cooperation among international scientists who met in Japan in May, 1990 to discuss the regulation of coronary blood flow.

Vortex Flow Akira Ogawa 1992-11-10 Vortex Flow presents a detailed description of the natural phenomena of vortices, fundamental concepts, and applications of the vortex flows. Numerous figures and examples illustrate concepts presented in this interesting book for mechanical, chemical, powder, and aeronautical engineers and engineering students.

Silent Enemies William Newman 2013-01-21 Cordosa, a small village in Brazil's most southern state of Rio Grande do Sul, is experiencing traumatic illness and loss of life from unknown causes. The population of landless farmers is slowly deteriorating. Jake Parker, ex U.S. Army Intelligence Officer, is assigned as a photojournalist to investigate the possible causes. What he soon discovers is that he will be watched, manipulated and harassed by high ranking United States government officials who will stop at nothing to gain revenge within their own ranks. With lives hanging in the balance, Jake finds himself in the middle of an undetected world of spiritual warfare and a congressional war filled with greed and corruption. As a beautiful young Deaf woman stumbles into the scandal, the hunt begins, and Jake Parker must figure out how to save her life as well as his own.

Fokker-Planck-Kolmogorov Equations Vladimir I. Bogachev 2015-12-17 This book gives an exposition of the principal concepts and results related to second order elliptic and parabolic equations for measures, the main examples of which are Fokker-Planck-Kolmogorov equations for stationary and transition probabilities of diffusion processes. Existence and uniqueness of solutions are

studied along with existence and Sobolev regularity of their densities and upper and lower bounds for the latter. The target readership includes mathematicians and physicists whose research is related to diffusion processes as well as elliptic and parabolic equations.

Introduction to Soft Matter Ian W. Hamley 2013-03-18 This book provides an introduction to this exciting and relativelynew subject with chapters covering natural and synthetic polymers,colloids, surfactants and liquid crystals highlighting the many andvaried applications of these materials. Written by an expert in thefield, this book will be an essential reference for people workingin both industry and academia and will aid in understanding of thisincreasingly popular topic. Contains a new chapter on biological soft matter Newly edited and updated chapters including updated coverageof recent aspects of polymer science. Contain problems at the end of each chapter to facilitateunderstanding

Fundamentals of Electromigration-Aware Integrated Circuit Design Jens Lienig 2018-02-23 The book provides a comprehensive overview of electromigration and its effects on the reliability of electronic circuits. It introduces the physical process of electromigration, which gives the reader the requisite understanding and knowledge for adopting appropriate counter measures. A comprehensive set of options is presented for modifying the present IC design methodology to prevent electromigration. Finally, the authors show how specific effects can be exploited in present and future technologies to reduce electromigration's negative impact on circuit reliability.

Biological Physics Philip Nelson 2003-07-18 Physics and engineering departments are building research programs in biological physics, but until now there has not been a synthesis of this dynamic field at the undergraduate level. Biological Physics focuses on new results in molecular motors, self-assembly, and single-molecule manipulation that have revolutionized the field in recent years, and integrates these topics with classical results. The text also provides foundational material for the emerging field of nanotechnology. The text is built around a self-contained core geared toward undergraduate students who have had one year of calculus-based physics. Additional "Track-2" sections contain more advanced material for senior physics majors and graduate students.

Oxford Handbook of Gastrointestinal Nursing Christine Norton 2008-01 The role of the gastrointestinal (GI) nurse has changed considerably over recent years. The development of endoscopic equipment has resulted in a demand for skilled nurses to perform procedures which, in the past, were carried out by doctors. In addition, nurses now commonly perform diagnostic tests and prescribe specific drugs in gastroenterology, and the widespread recognition of the need for psychosocial support for gastrointestinal patients, in areas such as Irritable Bowel Syndrome (IBS), has seen a large increase in the number of GI nurse consultants, nurse specialists, and nurse practitioners. GI nurses work with a wide range of patients from those suffering from minor and acute gastrointestinal disorders, through chronic conditions, to those requiring major surgery and treatment for malignant disease. The Oxford Handbook of Gastrointestinal Nursing summarizes the current state of knowledge in gastrointestinal nursing and provides user-friendly, evidence-based guidelines on the management of patietns with gastrointestinal disorders. Organized into three sections covering the principles of gastrointestinal nursing, the sections of the gut, and specific disorders of the digestive system, this handbook offers a wealth of information on how to plan, implement, manage, and evaluate nursing care for gastrointestinal patients, whether in the pediatric or adult setting. Topics featured include nutrition, pain management, complementary therapies, prescribing in GI nursing and emergencies. So you can find the information you need without delay, the book is clearly laid out with one topic per double page spread, and written in an easily readable note-based style. Blank pages for writing notes, observations and local protocols allow your handbook to be customised to meet your specific needs. All this is available at your fingertips, in a pocket-sized handbook with hard-wearing plastic covers. Written by practicing nurses and subject experts, the Oxford Handbook of Gastrointestinal Nursing is a unique and invaluable companion for practicing nurses, and for all health care professionals who are involved in the care of patients with gastrointestinal disorders.