

Callen Thermodynamics Solutions

Essentials of Thermodynamics offers a fresh perspective on classical thermodynamics and its explanation of natural phenomena. It combines fundamental principles with applications to offer an integrated resource for students, teachers and experts alike. The essence of classic texts has been distilled to give a balanced and in-depth treatment, including a detailed history of ideas which explains how thermodynamics evolved without knowledge of the underlying atomic structure of matter. The principles are illustrated by a vast range of applications, such as osmotic pressure, how solids melt and liquids boil, the incredible race to reach absolute zero, and the modern theme of the renormalization group. Topics are handled using a variety of techniques, which helps readers see how concepts such as entropy and free energy can be applied to many situations, and in diverse ways. The book has a large number of solved examples and problems in each chapter, as well as a carefully selected guide to further reading. The treatment of traditional topics like the three laws of thermodynamics, Carnot cycles, Clapeyron equation, phase equilibria, and dilute solutions is considerably more detailed than usual. For example, the chapter on Carnot cycles discusses exotic cases like the photon cycle along with more practical ones like the Otto, Diesel and Rankine cycles. There is a chapter on critical phenomena that is modern and yet highly pedagogical and contains a first principles calculation of the critical exponents of Van der Waals systems. Topics like entropy constants, surface thermodynamics, and superconducting phase transitions are explained in depth while maintaining accessibility for different readers.

Thermodynamic Approaches in Engineering Systems responds to the need for a synthesizing volume that throws light upon the extensive field of thermodynamics from a chemical engineering perspective that applies basic ideas and key results from the field to chemical engineering problems. This book outlines and interprets the most valuable achievements in applied non-equilibrium thermodynamics obtained within the recent fifty years. It synthesizes nontrivial achievements of thermodynamics in important branches of chemical and biochemical engineering. Readers will gain an update on what has been achieved, what new research problems could be stated, and what kind of further studies should be developed within specialized research. Presents clearly structured chapters beginning with an introduction, elaboration of the process, and results summarized in a conclusion Written by a first-class expert in the field of advanced methods in thermodynamics Provides a synthesis of recent thermodynamic developments in practical systems Presents very elaborate literature discussions from the past fifty years

This book differs from other thermodynamics texts in its objective which is to provide engineers with the concepts, tools, and experience needed to solve practical real-world energy problems. The presentation integrates computer tools (e.g., EES) with thermodynamic concepts to allow engineering students and practising engineers to solve problems they would otherwise not be able to solve. The use of examples, solved and explained in detail, and supported with property diagrams that are drawn to scale, is ubiquitous in this textbook. The examples are not trivial, drill problems, but rather complex and timely real world problems that are of interest by themselves. As with the presentation, the solutions to these examples are complete and do not skip steps. Similarly the book includes numerous end of chapter problems, both typeset and online. Most of these problems are more detailed than those found in other thermodynamics textbooks. The supplements include complete solutions to all exercises, software downloads, and additional content on selected topics. These are available at the book web site www.cambridge.org/KleinandNellis.

Containing the very latest information on all aspects of enthalpy and internal energy as related to fluids, this book brings all the information into one authoritative survey in this well-defined field of chemical thermodynamics. Written by acknowledged experts in their respective fields, each of the 26 chapters covers theory, experimental methods and techniques and results for all types of liquids and vapours. These properties are important in all branches of pure and applied thermodynamics and this vital source is an important contribution to the subject hopefully also providing key pointers for cross-fertilization between sub-areas.

Volumetric properties play an important role in research at the interface of physical chemistry and chemical engineering, but keeping up with the latest developments in the field demands a broad view of the literature. Presenting a collection of concise, focused chapters, this book offers a comprehensive guide to the latest developments in the field and a starting point for more detailed research. The chapters are written by acknowledged experts, covering theory, experimental methods, techniques, and results on all types of liquids and vapours. The editors work at the forefront of thermodynamics in mixtures and solutions and have brought together contributions from all areas related to volume properties, offering a synergy of ideas across the field. Graduates, researchers and anyone working in the field of volumes will find this book to be their key reference.

Based on a course given to beginning physics, chemistry, and engineering students at the Winterthur Polytechnic Institute, this text approaches the fundamentals of thermodynamics from the viewpoint of continuum mechanics. By describing physical processes in terms of the flow and balance of physical quantities, the book provides a unified approach to hydraulics, electricity, mechanics and thermodynamics. In this way it becomes clear that the entropy is the fundamental property that is transported in thermal processes and that the temperature is its measure. Previous knowledge of thermodynamics is not required, but readers should be familiar with basic electricity, mechanics, and chemistry and should have some knowledge of elementary calculus. Both the theory and applications are included as well as many exercises and solved problems from various fields of science and engineering.

Thermodynamics in Materials Science, Second Edition is a clear presentation of how thermodynamic data is used to predict the behavior of a wide range of materials, a crucial component in the decision-making process for many materials science and engineering applications. This primary textbook accentuates the integration of principles, strategies, a

This book is mainly concerned with building a narrow but secure ladder which polymer chemists or engineers can climb from the primary level to an advanced level without great difficulty (but by no means easily, either). This book describes some fundamentally important topics, carefully chosen, covering subjects from thermodynamics to molecular weight and its distribution effects. For help in self-education the book adopts a "Questions and Answers" format. The mathematical derivation of each equation is shown in detail. For further reading, some original references are also given. Numerous physical properties of polymer solutions are known to be significantly different from those of low molecular weight solutions. The most probable explanation of this obvious discrepancy is the large molar volume ratio of solute to solvent together with the large number of consecutive segments that constitute each single molecule of the polymer chains present as solute.

Thorough understanding of the physical chemistry of polymer solutions requires some prior mathematical background in its students. In the original literature, detailed mathematical derivations of the equations are universally omitted for the sake of space-saving and simplicity. In textbooks of polymer science only extremely rough schemes of the theories and then the final equations are shown. As a consequence, the student cannot learn, unaided, the details of the theory in which he or she is interested from the existing textbooks; however, without a full understanding of the theory, one cannot analyze actual experimental data to obtain more basic and realistic physical quantities. In particular,

if one intends to apply the theories in industry, accurate understanding and ability to modify the theory are essential.

This book contains the latest information on all aspects of the most important chemical thermodynamic properties of Gibbs energy and Helmholtz energy, as related to fluids. Both the Gibbs energy and Helmholtz energy are very important in the fields of thermodynamics and material properties as many other properties are obtained from the temperature or pressure dependence. Bringing all the information into one authoritative survey, the book is written by acknowledged world experts in their respective fields. Each of the chapters will cover theory, experimental methods and techniques and results for all types of liquids and vapours. This book is the fourth in the series of Thermodynamic Properties related to liquids, solutions and vapours, edited by Emmerich Wilhelm and Trevor Letcher. The previous books were: Heat Capacities (2010), Volume Properties (2015), and Enthalpy (2017). This book fills the gap in fundamental thermodynamic properties and is the last in the series.

Beyond Equilibrium Thermodynamics fills a niche in the market by providing a comprehensive introduction to a new, emerging topic in the field. The importance of non-equilibrium thermodynamics is addressed in order to fully understand how a system works, whether it is in a biological system like the brain or a system that develops plastic. In order to fully grasp the subject, the book clearly explains the physical concepts and mathematics involved, as well as presenting problems and solutions; over 200 exercises and answers are included. Engineers, scientists, and applied mathematicians can all use the book to address their problems in modelling, calculating, and understanding dynamic responses of materials.

Lectures on elementary statistical mechanics, taught at the University of Illinois and at the University of Pennsylvania.

This is the second edition of the book "Thermodynamics of Fluids under Flow," which was published in 2000 and has now been corrected, expanded and updated. This is a companion book to our other title Extended irreversible thermodynamics (D. Jou, J. Casas-Vázquez and G. Lebon, Springer, 4th edition 2010), and of the textbook Understanding non-equilibrium thermodynamics (G. Lebon, D. Jou and J. Casas-Vázquez, Springer, 2008). The present book is more specialized than its counterpart, as it focuses its attention on the non-equilibrium thermodynamics of flowing fluids, incorporating non-trivial thermodynamic contributions of the flow, going beyond local equilibrium theories, i.e., including the effects of internal variables and of external forcing due to the flow. Whereas the book's first edition was much more focused on polymer solutions, with brief glimpses into ideal and real gases, the present edition covers a much wider variety of systems, such as: diluted and concentrated polymer solutions, polymer blends, laminar and turbulent superfluids, phonon hydrodynamics and heat transport in nanosystems, nuclear collisions, far-from-equilibrium ideal gases, and molecular solutions. It also deals with a variety of situations, emphasizing the non-equilibrium flow contribution: temperature and entropy in flowing ideal gases, shear-induced effects on phase transitions in real gases and on polymer solutions, stress-induced migration and its application to flow chromatography, Taylor dispersion, anomalous diffusion in flowing systems, the influence of the flow on chemical reactions, and polymer degradation. The new edition is not only broader in scope, but more educational in character, and with more emphasis on applications, in keeping with our times. It provides many examples of how a deeper theoretical understanding may bring new and more efficient applications, forging links between theoretical progress and practical aims. This updated version expands on the trusted content of its predecessor, making it more interesting and useful for a larger audience.

A completely revised edition that combines a comprehensive coverage of statistical and thermal physics with enhanced computational tools, accessibility, and active learning activities to meet the needs of today's students and educators This revised and expanded edition of

Statistical and Thermal Physics introduces students to the essential ideas and techniques used in many areas of contemporary physics. Ready-to-run programs help make the many abstract concepts concrete. The text requires only a background in introductory mechanics and some basic ideas of quantum theory, discussing material typically found in undergraduate texts as well as topics such as fluids, critical phenomena, and computational techniques, which serve as a natural bridge to graduate study. Completely revised to be more accessible to students Encourages active reading with guided problems tied to the text Updated open source programs available in Java, Python, and JavaScript Integrates Monte Carlo and molecular dynamics simulations and other numerical techniques Self-contained introductions to thermodynamics and probability, including Bayes' theorem A fuller discussion of magnetism and the Ising model than other undergraduate texts Treats ideal classical and quantum gases within a uniform framework Features a new chapter on transport coefficients and linear response theory Draws on findings from contemporary research Solutions manual (available only to instructors)

This textbook takes an interdisciplinary approach to the subject of thermodynamics and is therefore suitable for undergraduates in chemistry, physics and engineering courses. The book is an introduction to phenomenological thermodynamics and its applications to phase transitions and chemical reactions, with some references to statistical mechanics. It strikes the balance between the rigorousness of the Callen text and phenomenological approach of the Atkins text. The book is divided in three parts. The first introduces the postulates and laws of thermodynamics and complements these initial explanations with practical examples. The second part is devoted to applications of thermodynamics to phase transitions in pure substances and mixtures. The third part covers thermodynamic systems in which chemical reactions take place. There are some sections on more advanced topics such as thermodynamic potentials, natural variables, non-ideal mixtures and electrochemical reactions, which make this book of suitable also to post-graduate students.

The only text to cover both thermodynamic and statistical mechanics--allowing students to fully master thermodynamics at the macroscopic level. Presents essential ideas on critical phenomena developed over the last decade in simple, qualitative terms. This new edition maintains the simple structure of the first and puts new emphasis on pedagogical considerations. Thermostatistics is incorporated into the text without eclipsing macroscopic thermodynamics, and is integrated into the conceptual framework of physical theory.

Learn classical thermodynamics alongside statistical mechanics and how macroscopic and microscopic ideas interweave with this fresh approach to the subjects.

The canonical ensemble - Other ensembles and fluctuations - Boltzmann statistics, fermi-dirac statistics, and bose-einstein statistics - Ideal monatomic gas - Ideal diatomic - Classical statistical mechanics - Ideal polyatomic - Chemical equilibrium - Quantum statistics - Crystals - Imperfect gases - Distribution functions in classical monatomic liquids - Perturbation theories of liquids - Solutions of strong electrolytes - Kinetic theory of gases and molecular collisions - Continuum mechanics - Kinetic theory of-gases and the boltzmann equation - Transport processes in dilute gases - Theory of brownian motion - The time-correlation function formalism.

This introductory textbook for standard undergraduate courses in thermodynamics has been completely rewritten to explore a greater number of topics, more clearly and concisely. Starting with an overview of important quantum behaviours, the book teaches students how to calculate probabilities in order to provide a firm foundation for later chapters. It introduces the ideas of classical thermodynamics and explores them both in general and as they are applied to specific processes and interactions. The remainder of the book deals with statistical mechanics. Each topic ends with a boxed summary of ideas and results, and every chapter contains numerous homework problems, covering a broad range of difficulties. Answers are given to odd-numbered problems, and solutions to even-numbered problems are available to instructors at

www.cambridge.org/9781107694927.

Variables of state and thermodynamic potentials; Chemical equilibrium. Solubility equilibria in soil solutions; Electrochemical equilibria in soils; The thermodynamic theory of ion exchange; The molecular theory of cation exchange; The thermodynamic theory of water soil.

This book presents new and updated developments in the molecular theory of mixtures and solutions. It is based on the theory of Kirkwood and Buff which was published more than fifty years ago. This theory has been dormant for almost two decades. It has recently become a very powerful and general tool to analyze, study and understand any type of mixtures from the molecular, or the microscopic point of view. The traditional approach to mixture has been, for many years, based on the study of excess thermodynamic quantities. This provides a kind of global information on the system. The new approach provides information on the local properties of the same system. Thus, the new approach supplements and enriches our information on mixtures and solutions.

This 2006 textbook discusses the fundamentals and applications of statistical thermodynamics for beginning graduate students in the physical and engineering sciences. Building on the prototypical Maxwell–Boltzmann method and maintaining a step-by-step development of the subject, this book assumes the reader has no previous exposure to statistics, quantum mechanics or spectroscopy. The book begins with the essentials of statistical thermodynamics, pauses to recover needed knowledge from quantum mechanics and spectroscopy, and then moves on to applications involving ideal gases, the solid state and radiation. A full introduction to kinetic theory is provided, including its applications to transport phenomena and chemical kinetics. A highlight of the textbook is its discussion of modern applications, such as laser-based diagnostics. The book concludes with a thorough presentation of the ensemble method, featuring its use for real gases. Numerous examples and prompted homework problems enrich the text.

One common feature of new emerging technologies is the fusion of the very small (nano) scale and the large scale engineering. The classical environment provided by single scale theories, as for instance by the classical hydrodynamics, is not anymore satisfactory. The main challenge is to keep the important details while still be able to keep the overall picture and simplicity. It is the thermodynamics that addresses this challenge. Our main reason for writing this book is to explain such general viewpoint of thermodynamics and to illustrate it on a very wide range of examples. Contents Levels of description Hamiltonian mechanics Irreversible evolution Reversible and irreversible evolution Multicomponent systems Contact geometry Appendix: Mathematical aspects

An understanding of statistical thermodynamic molecular theory is fundamental to the appreciation of molecular solutions. This complex subject has been simplified by the authors with down-to-earth presentations of molecular theory. Using the potential distribution theorem (PDT) as the basis, the text provides a discussion of practical theories in conjunction with simulation results. The authors discuss the field in a concise and simple manner, illustrating the text with useful models of solution thermodynamics and numerous exercises. Modern quasi-chemical theories that permit statistical thermodynamic properties to be studied on the basis of electronic structure calculations are given extended development, as is the testing of those theoretical results with ab initio molecular dynamics simulations. The book is intended for students taking up research problems of molecular science in chemistry, chemical engineering, biochemistry, pharmaceutical chemistry, nanotechnology and biotechnology.

The emergence and refinement of techniques in molecular biology has changed our perceptions of medicine, agriculture and environmental management. Scientific breakthroughs in gene expression, protein engineering and cell fusion are being translated by a strengthening biotechnology industry into revolutionary new products and services. Many a student has been enticed by the promise of biotechnology and

the excitement of being near the cutting edge of scientific advancement. However, graduates trained in molecular biology and cell manipulation soon realise that these techniques are only part of the picture. Reaping the full benefits of biotechnology requires manufacturing capability involving the large-scale processing of biological material. Increasingly, biotechnologists are being employed by companies to work in co-operation with chemical engineers to achieve pragmatic commercial goals. For many years aspects of biochemistry and molecular genetics have been included in chemical engineering curricula, yet there has been little attempt until recently to teach aspects of engineering applicable to process design to biotechnologists. This textbook is the first to present the principles of bioprocess engineering in a way that is accessible to biological scientists. Other texts on bioprocess engineering currently available assume that the reader already has engineering training. On the other hand, chemical engineering textbooks do not consider examples from bioprocessing, and are written almost exclusively with the petroleum and chemical industries in mind. This publication explains process analysis from an engineering point of view, but refers exclusively to the treatment of biological systems. Over 170 problems and worked examples encompass a wide range of applications, including recombinant cells, plant and animal cell cultures, immobilised catalysts as well as traditional fermentation systems. * * First book to present the principles of bioprocess engineering in a way that is accessible to biological scientists * Explains process analysis from an engineering point of view, but uses worked examples relating to biological systems * Comprehensive, single-authored * 170 problems and worked examples encompass a wide range of applications, involving recombinant plant and animal cell cultures, immobilized catalysts, and traditional fermentation systems * 13 chapters, organized according to engineering sub-disciplines, are grouped in four sections - Introduction, Material and Energy Balances, Physical Processes, and Reactions and Reactors * Each chapter includes a set of problems and exercises for the student, key references, and a list of suggestions for further reading * Includes useful appendices, detailing conversion factors, physical and chemical property data, steam tables, mathematical rules, and a list of symbols used * Suitable for course adoption - follows closely curricula used on most bioprocessing and process biotechnology courses at senior undergraduate and graduate levels. The main goal of this book is to provide an overview of the state of the art in the mathematical modeling of complex fluids, with particular emphasis on its thermodynamical aspects. The central topics of the text, the modeling, analysis and numerical simulation of complex fluids, are of great interest and importance both for the understanding of various aspects of fluid dynamics and for its applications to special real-world problems. New emerging trends in the subject are highlighted with the intent to inspire and motivate young researchers and PhD students.

This textbook covers the basic principles of statistical physics and thermodynamics. The text is pitched at the level equivalent to first-year graduate studies or advanced undergraduate studies. It presents the subject in a straightforward and lively manner. After reviewing the basic probability theory of classical thermodynamics, the author addresses the standard topics of statistical physics. The text demonstrates their relevance in other scientific fields using clear and explicit examples. Later chapters introduce phase transitions, critical phenomena and non-equilibrium phenomena.

As the title suggests, we introduce a novel differential approach to solution thermodynamics and use it for the study of aqueous solutions. We evaluate the quantities of higher order derivative than the normal thermodynamic functions. We allow these higher derivative data speak for themselves without resorting to any model system. We thus elucidate the molecular processes in solution, (referred to in this book "mixing scheme"), to the depth equal to, if not deeper, than that gained by spectroscopic and other methods. We show that there are three composition regions in aqueous solutions of non-electrolytes, each of which has a qualitatively distinct mixing scheme. The boundary

between the adjacent regions is associated with an anomaly in the third derivatives of G . The loci of the anomalies in the temperature-composition field form the line sometimes referred as "Koga line". We then take advantage of the anomaly of a third derivative quantity of 1-propanol in the ternary aqueous solution, 1-propanol – sample species – H_2O . We use its induced change as a probe of the effect of a sample species on H_2O . In this way, we clarified what a hydrophobe, or a hydrophile, and in turn, an amphiphile, does to H_2O . We also apply the same methodology to ions that have been ranked by the Hofmeister series. We show that the kosmotropes (salting out, or stabilizing agents) are either hydrophobes or hydration centres, and that chaotropes (salting in, or destabilizing agents) are hydrophiles. A new differential approach to solution thermodynamics A particularly clear elucidation of the mixing schemes in aqueous solutions A clear understandings on the effects of hydrophobes, hydrophiles, and amphiphiles to H_2O A clear understandings on the effects of ions on H_2O in relation to the Hofmeister effect A new differential approach to studies in multi-component aqueous solutions

This textbook concentrates on modern topics in statistical physics with an emphasis on strongly interacting condensed matter systems. The book is self-contained and is suitable for beginning graduate students in physics and materials science or undergraduates who have taken an introductory course in statistical mechanics. Phase transitions and critical phenomena are discussed in detail including mean field and Landau theories and the renormalization group approach. The theories are applied to a number of interesting systems such as magnets, liquid crystals, polymers, membranes, interacting Bose and Fermi fluids; disordered systems, percolation and spin of equilibrium concepts are also discussed. Computer simulations of condensed matter systems by Monte Carlo-based and molecular dynamics methods are treated. There are essentially two theories of solutions that can be considered exact: the McMillan–Mayer theory and Fluctuation Solution Theory (FST). The first is mostly limited to solutes at low concentrations, while FST has no such issue. It is an exact theory that can be applied to any stable solution regardless of the number of components and their concentrations, and the types of molecules and their sizes. Fluctuation Theory of Solutions: Applications in Chemistry, Chemical Engineering, and Biophysics outlines the general concepts and theoretical basis of FST and provides a range of applications described by experts in chemistry, chemical engineering, and biophysics. The book, which begins with a historical perspective and an introductory chapter, includes a basic derivation for more casual readers. It is then devoted to providing new and very recent applications of FST. The first application chapters focus on simple model, binary, and ternary systems, using FST to explain their thermodynamic properties and the concept of preferential solvation. Later chapters illustrate the use of FST to develop more accurate potential functions for simulation, describe new approaches to elucidate microheterogeneities in solutions, and present an overview of solvation in new and model systems, including those under critical conditions. Expert contributors also discuss the use of FST to model solute solubility in a variety of systems. The final chapters present a series of biological applications that illustrate the use of FST to study cosolvent effects on proteins and their implications for protein folding. With the application of FST to study biological systems now well established, and given the continuing developments in computer hardware and software increasing the range of potential applications, FST provides a rigorous and useful approach for understanding a wide array of solution properties. This book outlines those approaches, and their advantages, across a range of disciplines, elucidating this robust, practical theory.

Outstanding text focuses on physical technique of thermodynamics, typical problems, and significance and use of thermodynamic potential.

Mathematical apparatus, first law of thermodynamics, second law and entropy, more. 1965 edition.

Solutions Manual for Thermodynamics and an Introduction to Thermostatistics, Second Edition Thermodynamics and an Introduction to Thermostatistics John Wiley & Sons

This book provides an introduction to the emerging field of quantum thermodynamics, with particular focus on its relation to quantum information and its implications for quantum computers and next generation quantum technologies. The text, aimed at graduate level physics students with a working knowledge of quantum mechanics and statistical physics, provides a brief overview of the development of classical thermodynamics and its quantum formulation in Chapter 1. Chapter 2 then explores typical thermodynamic settings, such as cycles and work extraction protocols, when the working material is genuinely quantum. Finally, Chapter 3 explores the thermodynamics of quantum information processing and introduces the reader to some more state-of-the-art topics in this exciting and rapidly developing research field. This textbook covers basic principles of equilibrium behavior for systems of interest to chemical engineering, including elementary microscopic concepts. A strong emphasis is placed on fundamentals: energy conservation in open and closed systems (first law), temperature, entropy and reversibility (second law), fundamental equations, and criteria for equilibrium and stability. These concepts are then applied to the analysis of energy conversion processes, mixing, phase equilibria, and chemical reactions.

The aim of this book is to present Classical Thermodynamics in a unified way, from the most fundamental principles to non-uniform systems, thereby requiring the introduction of coarse graining methods, leading for instance to phase field methods. Solutions thermodynamics and temperature-concentration phase diagrams are covered, plus also a brief introduction to statistical thermodynamics and topological disorder. The Landau theory is included along with a general treatment of multicomponent instabilities in various types of thermodynamic applications, including phase separation and order-disorder transitions. Nucleation theory and spinodal decomposition are presented as extreme cases of a single approach involving the all-important role of fluctuations. In this way, it is hoped that this coverage will reconcile in a unified manner techniques generally presented separately in physics and materials texts.

Volume 5.

The first comprehensive graduate-level introduction to stochastic thermodynamics Stochastic thermodynamics is a well-defined subfield of statistical physics that aims to interpret thermodynamic concepts for systems ranging in size from a few to hundreds of nanometers, the behavior of which is inherently random due to thermal fluctuations. This growing field therefore describes the nonequilibrium dynamics of small systems, such as artificial nanodevices and biological molecular machines, which are of increasing scientific and technological relevance. This textbook provides an up-to-date pedagogical introduction to stochastic thermodynamics, guiding readers from basic concepts in statistical physics, probability theory, and thermodynamics to the most recent developments in the field. Gradually building up to more advanced material, the authors consistently prioritize simplicity and clarity over exhaustiveness and focus on the development of readers' physical insight over mathematical formalism. This approach allows the reader to grow as the book proceeds, helping interested young scientists to enter the field with less effort and to contribute to its ongoing

vibrant development. Chapters provide exercises to complement and reinforce learning. Appropriate for graduate students in physics and biophysics, as well as researchers, Stochastic Thermodynamics serves as an excellent initiation to this rapidly evolving field. Emphasizes a pedagogical approach to the subject Highlights connections with the thermodynamics of information Pays special attention to molecular biophysics applications Privileges physical intuition over mathematical formalism Solutions manual available on request for instructors adopting the book in a course This text presents statistical mechanics and thermodynamics as a theoretically integrated field of study. It stresses deep coverage of fundamentals, providing a natural foundation for advanced topics. The large problem sets (with solutions for teachers) include many computational problems to advance student understanding.

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