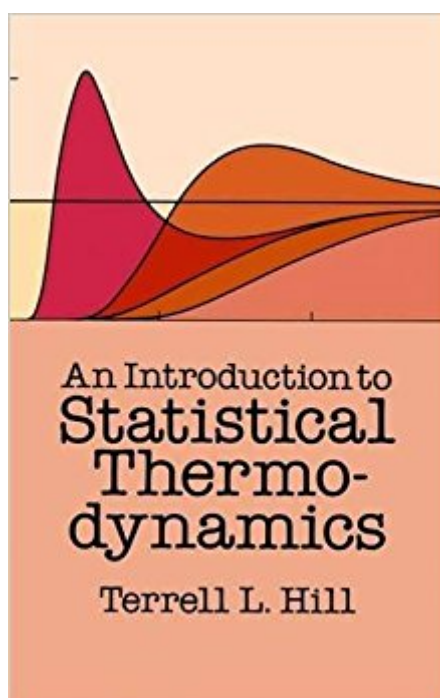


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An Introduction To Statistical Thermodynamics (Dover Books On Physics)



Synopsis

"A large number of exercises of a broad range of difficulty make this book even more useful— a good addition to the literature on thermodynamics at the undergraduate level."

• Philosophical Magazine

Although written on an introductory level, this wide-ranging text provides extensive coverage of topics of current interest in equilibrium statistical mechanics. Indeed, certain traditional topics are given somewhat condensed treatment to allow room for a survey of more recent advances. The book is divided into four major sections. Part I deals with the principles of quantum statistical mechanics and includes discussions of energy levels, states and eigenfunctions, degeneracy and other topics. Part II examines systems composed of independent molecules or of other independent subsystems. Topics range from ideal monatomic gas and monatomic crystals to polyatomic gas and configuration of polymer molecules and rubber elasticity. An examination of systems of interacting molecules comprises the nine chapters in Part III, reviewing such subjects as lattice statistics, imperfect gases and dilute liquid solutions. Part IV covers quantum statistics and includes sections on Fermi-Dirac and Bose-Einstein statistics, photon gas and free-volume theories of quantum liquids. Each chapter includes problems varying in difficulty— ranging from simple numerical exercises to small-scale "research" propositions. In addition, supplementary reading lists for each chapter invite students to pursue the subject at a more advanced level. Readers are assumed to have studied thermodynamics, calculus, elementary differential equations and elementary quantum mechanics. Because of the flexibility of the chapter arrangements, this book especially lends itself to use in a one-or two-semester graduate course in chemistry, a one-semester senior or graduate course in physics or an introductory course in statistical mechanics.

Book Information

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Customer Reviews

I'm a second year grad student coming from some measure of background in quantum mechanics and thermodynamics, but with no experience in statistical mechanics. I found Hill's book a fantastic introduction to the topic. Of particular note is his terse but clear writing - he very quickly and accurately conveys requisite information in each of his derivations, making the text easily understandable. I've had none of the problems of ambiguities or a lack of clarity that can be encountered in many physics textbooks. I can highly recommend this title, it's one of the better written physics textbooks I've seen.

I am a devout follower of this book - it's written by a genius for people who really want to understand stat thermoD, not just to prepare for classes, but to gain a perspective on how to handle the tedious mathematical structure of stat thermoD. I am absolutely in love with this book and have found it to be much much more challenging and interesting than other comparable books, which border on spoon feeding its reader with every morbid detail (most of which are often quite basic concepts). It's to the point, written with authority. He covers quite a large number of topics. Although the book is quite old, its structure is very appealing to me. Those who like succinct equations to try and understand a concept - they would love with this book, right from the very first chapter. This book has another complementary book by the same author (Statistical Mechanics: Principles and Selected Applications) which takes things a step further. People who prefer long discussions rather than equations would absolutely hate this book. I would strongly recommend everybody to take a chance with this book. I am a beginner only and do not have a good idea about the other books out there - but I find this book much more useful than those by Landau or Macquarrie (although I dunno about Chandler or Kardar or Pathria). People with a decent math background who are looking to learn stat mech should absolutely try this out and it's so damn cheap - wouldn't hurt if you don't like it eventually. But I like this book so much that I would even volunteer to be a spokesperson for it :P

If you are interested with studying statistical mechanics then start here. Hill starts from the definitions and postulates of thermodynamics and then moves into applications and problems. You will need to

understand Diff EQ for this book. The first chapter took me a week to read and work out the math but then I read the rest in 4 weeks. It is a hard start because Hill develops your background before starting with applications of the theory. I really began to grasp the subject after reading this book. Other books will not lay the math out as well as Hill does. It is a hard read because Hill is so thorough, but the reward is well worth the struggle. It is a great introduction and I suggest all of Hill's Stat mech book. Another great bargain from DOVER PRESS. At the price I recommend it to all graduate chemical engineers and chemists

This introductory text is a fine way to gain a solid, albeit somewhat dated, introduction to statistical mechanics and thermodynamics. It will be especially useful to students and workers in molecular biophysics, and physical chemistry.

It's a standard, and essential to anyone who needs the reference. Anyone who likes/needs a book on this topic should have it in their library. Be sure to remember that the level is upper college to graduate level.

Good book. Difficult content. Not for the ordinary

This book is what I really need for my statistic thermodynamic course.

good

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