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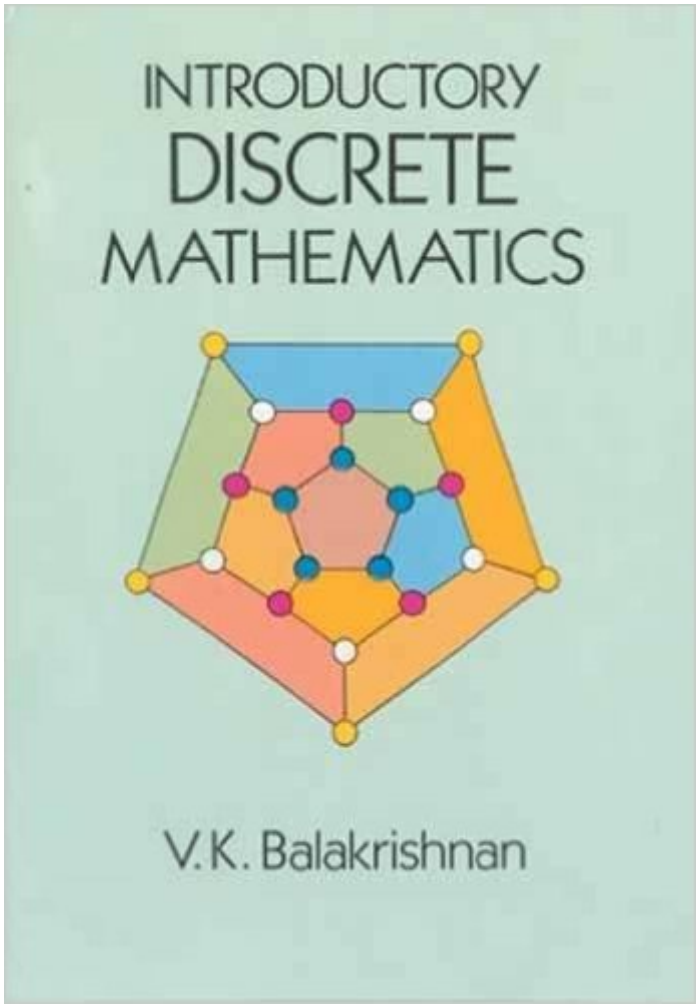
Introductory Discrete Mathematics (Dover Books On Computer Science)



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Synopsis

This concise text offers an introduction to discrete mathematics for undergraduate students in computer science and mathematics. Mathematics educators consider it vital that their students be exposed to a course in discrete methods that introduces them to combinatorial mathematics and to algebraic and logical structures focusing on the interplay between computer science and mathematics. The present volume emphasizes combinatorics, graph theory with applications to some stand network optimization problems, and algorithms to solve these problems.Chapters 0â “3 cover fundamental operations involving sets and the principle of mathematical induction, and standard combinatorial topics: basic counting principles, permutations, combinations, the inclusion-exclusion principle, generating functions, recurrence relations, and an introduction to the analysis of algorithms. Applications are emphasized wherever possible and more than 200 exercises at the ends of these chapters help students test their grasp of the material.Chapters 4 and 5 survey graphs and digraphs, including their connectedness properties, applications of graph coloring, and more, with stress on applications to coding and other related problems. Two important problems in network optimization â • the minimal spanning tree problem and the shortest distance problem â • are covered in the last two chapters. A very brief nontechnical exposition of the theory of computational complexity and NP-completeness is outlined in the appendix.

Book Information

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Customer Reviews

I was misled by the low price thinking this would be a bad book. But I was Mathematics. The reason

for which I bought this text book is because it has many proofs and in particular it includes the proofs of a couple of theorems I had been looking for. The presentation is formal but clear. The author includes plenty of excercises and answers are provided for odd numbered ones. So far I haven't found errors or typos. The book has enough material to be used in a two semester course sequence. I would give it a relations, total and partial orders, logic, combinatorics, regular languages, graphs, number theory, algorithm analysis and even NP-completeness. This book should be useful for both Math and CS students.

As with any Dover text, it is important to remember that this text is designed to teach the material, not to coddle the reader. This text provides broad and deep coverage of the various topics that fall under discrete mathematics (set theory, boolean logic, graph theory, etc.) with clarity and simplicity. This book is not designed to help you pass a test, but is instead designed to help you grasp and understand the topic, which it does very well. Easily the best book I own on this topic (I often joke that the author covered my first semester course on discrete math in the first chapter!).

This book is full of great examples and loads of practice problems. Its descriptions, for students fairly comfortable with mathematical writing, are concise and no-nonsense, which can be great. It makes a good reference, in that way, but the book doesn't do much to guide your intuition. It's also full of tiny mistakes (seemingly due to rushed editing) that should be no problem for an advanced student or someone working closely with another guide to the subject (a teacher, tutor, or other textbook). But for learners who might struggle with the material, these mistakes in the book can really interrupt understanding. (As a result, I chose not to assign this book to my students.)

An excellent introductory book on descrete mathematics. The book begins with a general overview of set theory, which I would agree is an appropriate starting point. The coverage of combinatorics is very good and easy for the reader to follow. I think this is a critical topic because my experience indicates that many mathematics students struggle with the subject of combinatorics. The clear description and excellent examples provided in this text are quite good.The discussions of generating functions is clear and concise. The chapter on graph theory is very good and easy to understand. As with all topics in any introductory book, much more could be written about graph theory, but enough is given to provide the reader a general understanding of the topic. An entire chapter is devoted to spanning tree problems, which is refreshing to see.

The reviews for this text seem to be split between educators with a solid grasp of the material within the text, and frustrated students. As a learning tool for new to discrete math, the average test scores of my class demonstrate this book to be a complete failure. This text may provide concise explanations for those in search of a quick review of concepts, but it sacrifices its effectiveness as a learning tool for new students in exchange for a short page count. Professors choosing this text are setting both themselves and their students up for a semester of frustration.As a student myself, I'll go over a few of the reasons this text has proven to be a poor choice. Many of the examples within aren't thoroughly explained. The author prefers to bridge steps in problems by saying "of course" "obviously" "easily" and "thus" rather than provide a step-by-step breakdown. While these problems may be simple to understand and review for those with a solid grasp of the material, these gaps are unforgivable for students attempting to use the text to help guide learning. When I work through homework problems, I use the examples and lecture notes as tools. When the book's examples use phrases like "of course" and "we easily find" to jump to conclusions I do not easily see, the only result I get is frustration and wasted hours. In addition, problem sets contain errors. On at least 3 different occasions, my professor has had to correct errors found within assigned exercises from the book. As a student, it is my first instinct to assume I did something wrong when my answer does not match that of the author. I judge this text by the disproportionate amount of time I have to spend trying to google better explanations.

This is the best introduction to discrete math I have ever seen. I have used it as a textbook when teaching fundamentals of discrete math for cryptography.

I've taken a first semester Discrete Math course, and am currently taking the second semester of it. I bought this book on a whim, hoping it might supplement my text, or at least clarify a few points. It fails at both of those things. Here's why:1) Abundant errors: I read the first 15 pages and found at least one *serious* typo per page (i.e. a typo that could impede learning). Plus, the grammar ranges from illegal to ambiguous. Thankfully, I was familiar with all of the material that I was reading -- were I not, severe confusion and discouragement would have been the result.2) Poor examples: They're too abstract or too simple -- and there aren't even very many of them. Oftentimes, he contradicts what he's trying to illustrate due to a small oversight or typo. It's truly bad.3) Gratuitous brevity (yes I know that may sound paradoxical): The author uses compound sentences in his definitions; sometimes going as far as to define two or three concepts IN THE SAME SENTENCE! It's infuriating.4) Chapter Zero: This deserves its own rant section. Chapter zero contains nearly all of

the material from the first four chapters of my current textbook: Logic, Set theory, Induction, Relations, etc. Somehow the author crams all of it into about 24 pages (plus 4 or 5 pages of exercises). He fails at clarity or lucidity. It's an ambomination -- it reads like lecture notes (you know, the ones only the professor looks at).OK -- I WANTED to like this book. It's kind of cute, I'll admit it. And the price is sweet. But friends, you get what you pay for. Even after I came across the first 5 or so serious typos I was willing to forgive. Eventually, the sheer amount of contradictory examples and ambiguous sentences riled me up so much that I considered tearing the book in half. Really. I doubt I'll ever open the thing again.

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