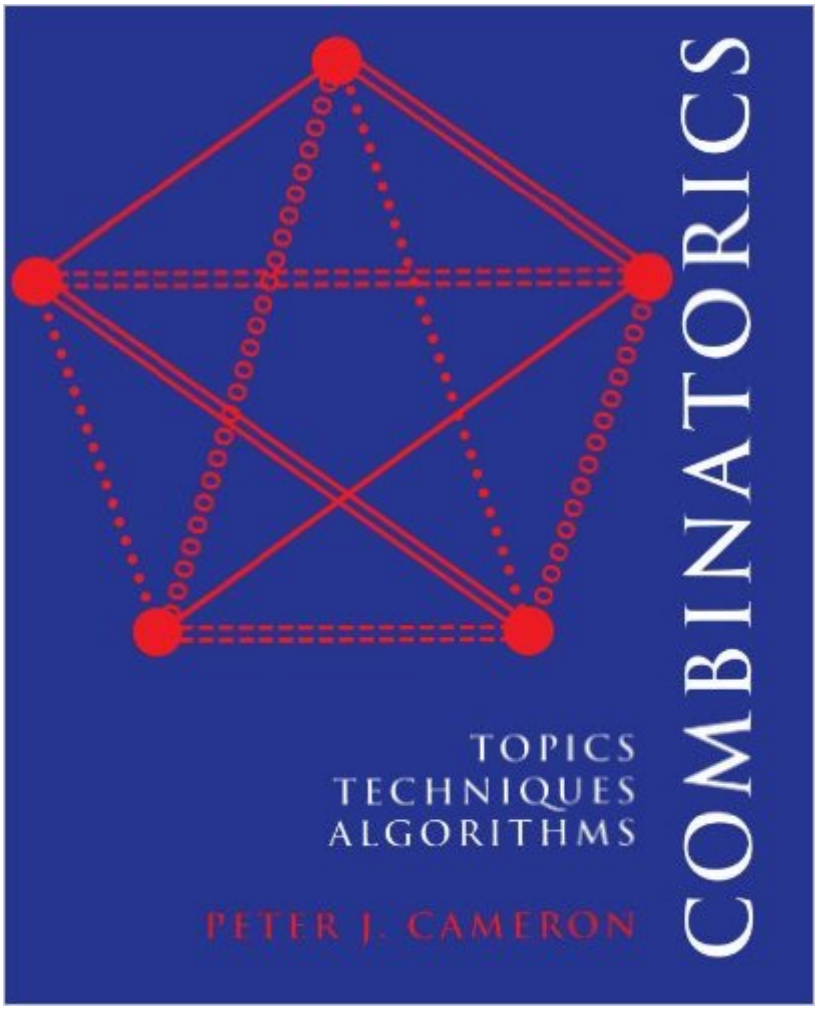
# Combinatorics: Topics, Techniques, Algorithms



## Synopsis

Combinatorics is a subject of increasing importance because of its links with computer science, statistics, and algebra. This textbook stresses common techniques (such as generating functions and recursive construction) that underlie the great variety of subject matter, and the fact that a constructive or algorithmic proof is more valuable than an existence proof. The author emphasizes techniques as well as topics and includes many algorithms described in simple terms. The text should provide essential background for students in all parts of discrete mathematics.

## Book Information

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## Customer Reviews

Combinatorics is a bit of an oddity. Although a few principles (like pigeonholing) apply in many cases, every combinatorial problem has unique features. Attacking a new situation is almost like starting all over again, unless you can recognize an old problem in your new one.This book gives a number brief case studies. Its 18 chapters (not counting intro and closing) span a variety of interesting topics. Cameron doesn’t write down to the reader - it takes serious thought and some mathematical background to get full value from the reading. The examples are nowhere near as concrete as you’d expect in a popularized version. Still, the author avoids opaque references to specialist terms, and keeps the text approachable.I have personal reason to like this book more than it’s high quality warrants. I was thumbing through it in a store, and skimmed a page that described Kirkman’s schoolgirls (a two-level problem in selecting subsets). Quite abruptly, I realized that those charming young ladies exactly represented a problem I had in connecting the parts of a

multiprocessor. One or two references later, I had a practical way out of a potentially ugly quandry. This material is not just fun for its own intellectual challenge, it has application to real engineering, too.

This isn’t your usual "urn-has-3-red-balls-and-5-white-balls" sort of combinatorics book. It’s sigma notation all over the place, if you know what I mean.The first part can be used for undergraduates and the second part is more advanced. The book is broad in scope because, as the author explains, so is the subject matter.The chapters have "techniques" and "algorithms." It’s not a book that has a slew of examples of combinatorial problems (like so many), but leans toward mathematical sophistication in formalizing the techniques. This is either a feature or a bug, depending on what you needs are. For instance, it’s not very often that introductory books present derrangements next to Fibonacci numbers. Or explain how calculate the average number of comparisons that Hoare’s Quicksort does with a differential equation for the recurrence relation in the context of finite fields. It sounds scary, I know, but if you look at the explanation, you’ll see you should have been born a nephew to this author.In case you like Knuth’s Concrete Mathematics you will like this book too (there’s some overlap, because both are concerned with the analysis of algorithms). Knuth’s book works more on skill-building, and I think Cameron’s book is better for theoretical explanation.Disclaimer: I haven’t worked with the whole book (because of a lack of time - "Ars long, vita brevis", as they say).

The book is divided into two parts corresponding roughly to undergraduate material and graduate. The selection of topics is robust; the writing is clear and consise. The level is senior and above. The reader should have some knowledge of advanced math such as group theory, and analysis of algorithms. Great book! One of the best ever!

This is a graduate level text that presents advanced material and yet is easier to understand than most high school texts and could probably be used without trouble at the undergraduate level. The writing is vibrant and lucid; it is a pleasure to read. I could come up with a few minor complaints about the presentation of this or that but these comments would be silly and not very relevant.The book contains an absolute wealth of topics. There is an interesting combinatorial approach to groups, and the book’s presentation of certain topics, such as matroids and quasigroups, is among the best I have found; many books make these structures appear painfully abstract and difficult to grasp. The book is organized so that it’s fairly easy to skip around, but I actually like the order in

which the topics are presented.This text makes an excellent addition to the collection of anyone interested in combinatorics, and if someone were to buy only one book on the subject, I would recommend this book. I think this would make an excellent textbook--it was used as such in one of my graduate courses, and would probably be suitable for an undergraduate course as well.



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