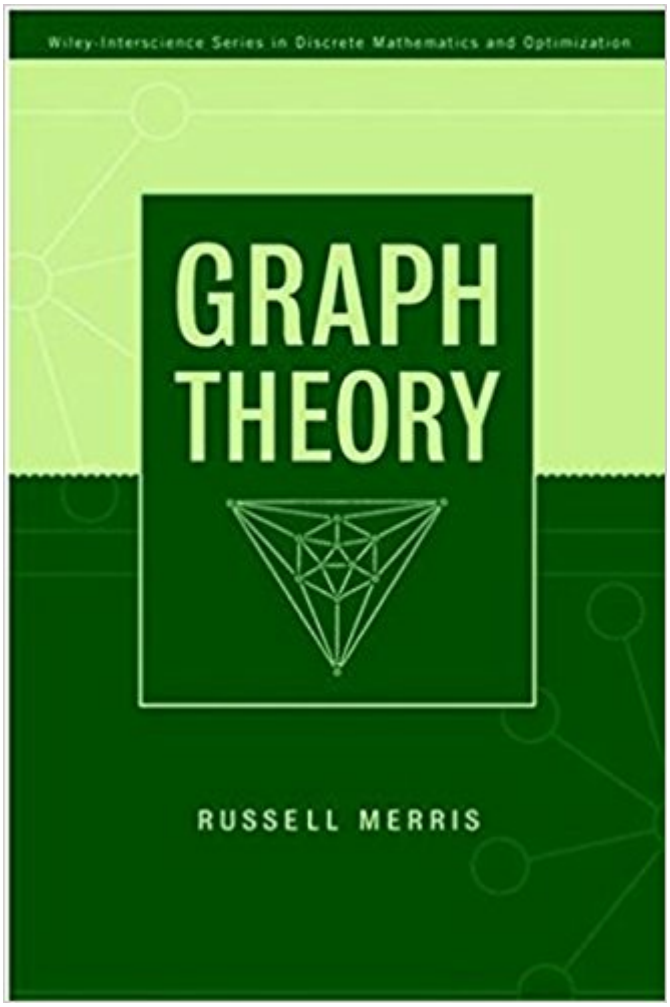
Graph Theory (Wiley Series In Discrete Mathematics And Optimization)



Synopsis

A lively invitation to the flavor, elegance, and power of graph theory This mathematically rigorous introduction is tempered and enlivened by numerous illustrations, revealing examples, seductive applications, and historical references. An award-winning teacher, Russ Merris has crafted a book designed to attract and engage through its spirited exposition, a rich assortment of well-chosen exercises, and a selection of topics that emphasizes the kinds of things that can be manipulated, counted, and pictured. Intended neither to be a comprehensive overview nor an encyclopedic reference, this focused treatment goes deeply enough into a sufficiently wide variety of topics to illustrate the flavor, elegance, and power of graph theory. Another unique feature of the book is its user-friendly modular format. Following a basic foundation in Chapters 1-3, the remainder of the book is organized into four strands that can be explored independently of each other. These strands center, respectively, around matching theory; planar graphs and hamiltonian cycles; topics involving chordal graphs and oriented graphs that naturally emerge from recent developments in the theory of graphic sequences; and an edge coloring strand that embraces both Ramsey theory and a self-contained introduction to PÃƒÂ lya's enumeration of nonisomorphic graphs. In the edge coloring strand, the reader is presumed to be familiar with the disjoint cycle factorization of a permutation. Otherwise, all prerequisites for the book can be found in a standard sophomore course in linear algebra. The independence of strands also makes Graph Theory an excellent resource for mathematicians who require access to specific topics without wanting to read an entire book on the subject.

Book Information

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Customer Reviews

Reviewed jointly with "A Beginner's Guide to Graph Theory" by W.D. Wallis published by Birkhauser: "...both...are...quite similar.... Merris writes in a lively tone...all...have adequate sets of exercises. Those in Graph Theory are somewhat more generous, and perhaps more challenging...both are appropriate for upper-division undergraduates." (Choice, May 2001, Vol. 38 No. 9) Compared to Graphs and Applications by Aldous and Wilson (Springer-Verlag 2000) and A Beginner's Guide to Graph Theory by Wallis (Birkhauser 2000): "...M [Merris] has a...sophisticated chapter on graphic sequences...some very nice material...which sets it apart from the other two books...all three books are well written.... I am especially impressed with the exercises in M. Not only are there more in M than in the other two books...but there is an excellent range of levels of the problems..." (SIAM Review, Vol. 43, No. 3) "...a mathematically rigorous introduction and designed as a versatile instruction tool..." (Quarterly of Applied Mathematics, Vol. LIX, No. 2, June 2001) "The author's intent to write a lean and lively invitation to graph theory designed to attract and engage students, is well met..." (Zentralblatt MATH, Vol. 963, 2001/13)

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Merris has tried to write a text suitable for a one-semester introduction to graph theory for undergraduates with little background required (merely standard proof techniques). He has succeeded in writing a text that can be covered in one term, if you rush, rush, and rush some more. However, he has relegated some important topics to poorly-written exercises (e.g., Euler tours and such). The text also lacks cohesiveness. The Preface makes it clear that Merris wants the book to lead to four independent strands after the initial three chapters. However, a single chapter does not constitute a "strand" to be followed, and the only set of chapters that becomes cohesive at the end is 7, 8, and 9. Regarding chapter 9, don’t let the title "Oriented Graphs" mislead you. A tiny portion of the chapter deals with oriented graphs as an excuse to introduce the vertex-edge incidence matrix and then the Laplacian matrix, and the rest of the chapter is devoted to properties of the Laplacian spectrum.Another complaint is that this text brushes over multigraphs and doesn’t even think of talked about digraphs beyond the dumbing-down of digraphs to oriented graphs in chapter 9.The author’s writing style is clear and student-friendly, and the chapters have a good selection of exercises. However, instructors should do the exercises before assigning them, as we encountered at least one unprovable proposition that was simply stated as "Show that ..." There is also at least one statement that is much more difficult than Merris intended.I think that future editions of this text could have some promise, but it needs work.

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