

# Preface to the Fourth Edition

*Welcome back, my friends,  
to the show that never ends....*  
EMERSON, LAKE & PALMER

Once again, the new edition has been thoroughly revised, even though the changes are less extensive than for the third edition. (Well, one does hope for some sort of convergence of the writing process.)

In particular, I have again added some further material: more on NP-completeness (especially on dominating sets), a section on the Gallai-Edmonds structure theory for matchings, and about a dozen additional exercises—as always, with solutions. Moreover, the section on the 1-factor theorem has been completely rewritten: it now presents a short direct proof for the more general Berge-Tutte formula.

I have also used this opportunity to discuss several recent research developments and added quite a few references. Finally, smaller changes and corrections—mainly to typographical errors—have been made.

As always, I am indebted to my students and assistants for their attention and interest. Special thanks are due to Dr. Matthias Tinkl who was in charge of the examples classes for a couple of lecture courses based on this text and also contributed several improved figures, and to one of our students, Alexander Müller, for his careful reading and helpful suggestions.

Augsburg

Dieter Jungnickel

# Preface to the Third Edition

*The show must go on.*

IRA GERSHWIN

This new third edition has again been thoroughly revised, even though the changes are not as extensive as in the second edition. Of course, the general aims of the book have remained the same.

In particular, I have added some additional material, namely two new sections concerning graphical codes (which provides a less obvious area of application and, as I hope, might also interest the reader in the important field of coding theory) and about two dozen further exercises (as usual, with solutions). I have also discussed and referenced recent developments, especially for the travelling salesman problem, where truly impressive new world records have been achieved. Moreover, the presentation of the material has been improved in quite a few places, most notably in the chapters on shortest paths and colorings. In addition to this, many smaller changes and corrections have been made, and the proofs of several theorems have been rewritten to make them more transparent, or more precise.

Again, I thank my students and assistants for their attention and interest as well as the input they provided. Moreover, I am indebted to several readers who alerted me to some (fortunately, more or less minor) problems; and I am, of course, also grateful for the encouraging comments I have received.

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