MR2493430 (2010h:05004) 05-01 (05Cxx)

Voloshin, Vitaly I.

★**Introduction to graph theory.**

Nova Science Publishers, Inc., New York, 2009. *x*+144 *pp*. $79.00.
ISBN 978-1-60692-374-0; 1-60692-374-9

From the preface: “Graph theory is an important area of contemporary mathematics with many applications in computer science, genetics, chemistry, engineering, industry, business and the social sciences. It is a young science invented and developed for solving challenging problems of a ‘computerized’ society for which traditional areas of mathematics such as algebra or calculus are powerless.

“This book is for math and computer science majors and for students and representatives of many other disciplines (like bioinformatics, for example) taking courses in graph theory, discrete mathematics, data structures, and algorithms. It is also for anyone who wants to understand the basics of graph theory or is just curious. No previous knowledge of graph theory or any other significant mathematics is required. The very basic facts from set theory, proof techniques and algorithms are sufficient to understand it, but even those are explained in the text.

“The book discusses the key concepts of graph theory with emphasis on trees, bipartite graphs, cycles, chordal graphs, planar graphs and graph coloring.

“The reader is conducted from the simplest examples, definitions and concepts step by step towards an understanding of a few of the most fundamental facts in the field. When writing I pursued the following goals:

- to make it as readable as possible;
- to choose the most instructive (not complex!) theorems and algorithms;
- to exhibit sequential generalization of concepts and ideas;
- to show an interaction between the sections and chapters for the sake of integrity;
- to clearly expose the essence and core of graph theory.

“The book may be used at the undergraduate level for a one semester introductory course. It includes many examples, figures and algorithms; each section ends with a set of exercises and a set of computer projects. Answers and hints for selected exercises are provided at the end of the book. The material has been tested in class during more than 20 years of teaching experience of the author. Math majors will pay more attention to theorems and proofs, computer science majors will work more with the concepts, algorithms and computations, and representatives of other sciences will find models and ideas for solutions of optimization problems in their fields.

“From the contents, four core areas of graph theory have been chosen: bipartite graphs, chordal graphs, planar graphs and graph coloring. The text exhibits the survey of basic results in these areas. Bipartite graphs, planar graphs and graph colorings are the source, the origin of graph theory. Chordal graphs, discovered much later, have a very special place in the entire theory: because of their simplicity and very many nice properties, they are the best playground for an introduction to

graph theory.”