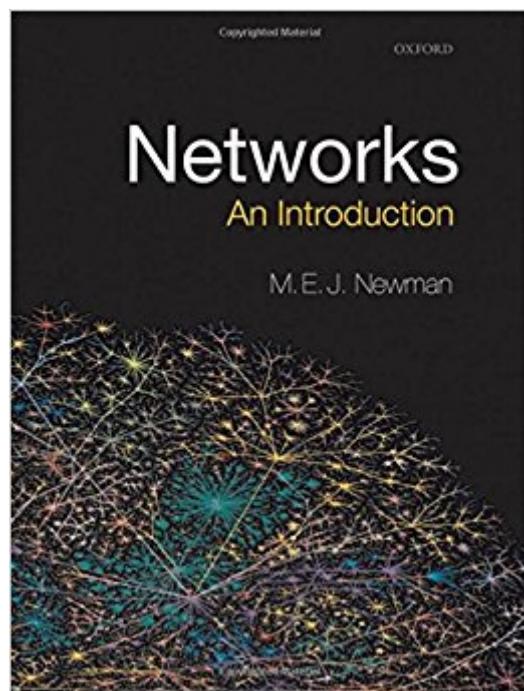


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# Networks: An Introduction



## **Synopsis**

The scientific study of networks, including computer networks, social networks, and biological networks, has received an enormous amount of interest in the last few years. The rise of the Internet and the wide availability of inexpensive computers have made it possible to gather and analyze network data on a large scale, and the development of a variety of new theoretical tools has allowed us to extract new knowledge from many different kinds of networks. The study of networks is broadly interdisciplinary and important developments have occurred in many fields, including mathematics, physics, computer and information sciences, biology, and the social sciences. This book brings together for the first time the most important breakthroughs in each of these fields and presents them in a coherent fashion, highlighting the strong interconnections between work in different areas. Subjects covered include the measurement and structure of networks in many branches of science, methods for analyzing network data, including methods developed in physics, statistics, and sociology, the fundamentals of graph theory, computer algorithms, and spectral methods, mathematical models of networks, including random graph models and generative models, and theories of dynamical processes taking place on networks. To request a copy of the Solutions Manual, visit: <http://global.oup.com/uk/academic/physics/admin/solutions>

## **Book Information**

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## **Customer Reviews**

"[Networks] distinguishes itself from other network texts by its attention to the breadth of both the areas to which networks have been applied and the techniques for reasoning about them. It is likely to become the standard introductory textbook for the study of networks, and it is valuable as a desk-side reference for anyone who works with network problems." -- H. Van Dyke Parunak,

Computing Reviews"An excellent textbook for the growing field of networks. It is cleverly written and suitable as both an introduction for undergraduate students and as a roadmap for graduate students. Furthermore, its more than 300 bibliographic references will guide readers who are interested in particular topics. Being highly self-contained, computer scientists and professionals from other fields can also use the book -- in fact, the author himself is a physicist. In short, this book is a delight for the inquisitive mind." -- Fernando Berzal, Computing Reviews

Mark Newman received a D.Phil. in physics from the University of Oxford in 1991 and conducted postdoctoral research at Cornell University before joining the staff of the Santa Fe Institute, a think-tank in New Mexico devoted to the study of complex systems. In 2002 he left Santa Fe for the University of Michigan, where he is currently Paul Dirac Collegiate Professor of Physics and a professor in the university's Center for the Study of Complex Systems.

If you are a layman of network study and want to learn about it in a quantitative way, this is a wonderful book to start from. If you do work on networks, you probably already have this book, for it serves as an excellent reference too. This book gives a comprehensive and rigorous introduction to the core concepts of networks (vertex, edge, degree, centrality, component, path, etc.) and classical algorithms to do computations. Prof. Newman's writing style is extremely clear. There are no logic gaps between sentences. Whenever you find something unclear or confusing during reading, you will find an explanation in the following paragraphs.

Excellent introduction to graph theory from an expert in the field. Although I have access to this book at the library, I wanted a hard copy to keep as a reference on my desk because I

A relatively easy book to read given some college level math background such as calculus and matrix algebra. But, the insights and applications are very useful in understanding our world of systems and change. Networks are not stressed enough in school and even at many universities. This is unfortunate given the wide applicable of network theory in our professional and even daily life.

I use network analysis in ecological research. I have found most reference books either highly technical or so simplistic as to be of little use. This new book is the exception. It is quite well-written, and covers much recent applied research that uses network theory, as well as the

analytical and computational background behind these applications. As well as being a good textbook, it is a great introduction to the topic for quantitative researchers in other fields that wish to apply network analysis to their work, and because it is up-to-date, I will continue to use it as a reference in the future.

Great reference with clearly developed examples. The layout made it enjoyable to read. The math is very digestable for anyone at a slightly post Calc level. (although clearly Calc is not needed) Combine this with a bit of "R" code and you can actually build projects in the area.

The book really is an excellent guide to the vast domain of graphs and diagramming. It covers many topics and applications while remaining very readable despite the fact that it discusses various technical topics. I'd say it's an excellent bridge between the domain from a mathematical point of view and from an applicative angle. If you need a gateway to this domain and a have an undergraduate understanding of maths then this book is for you. [Things I wished would have been highlighted; the relation to knots and an introduction to graph layout algorithms.]

Networks by M. E. J. Newman is just invaluable for anyone working in the field of network related phenomena. I have already read through Chapter 11, and I have found both improvements in algorithms I had already implemented, and new methods that I didn't know about at all. I am only sorry that it took two years for me to discover this book!

This is an excellent book, extremely well-written. Contains a lot of information about the networks, their analysis, structure, and algorithms for their investigations. Gives a well-balanced theory of the analytic and probabilistic methods to study and analyse the networks.

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