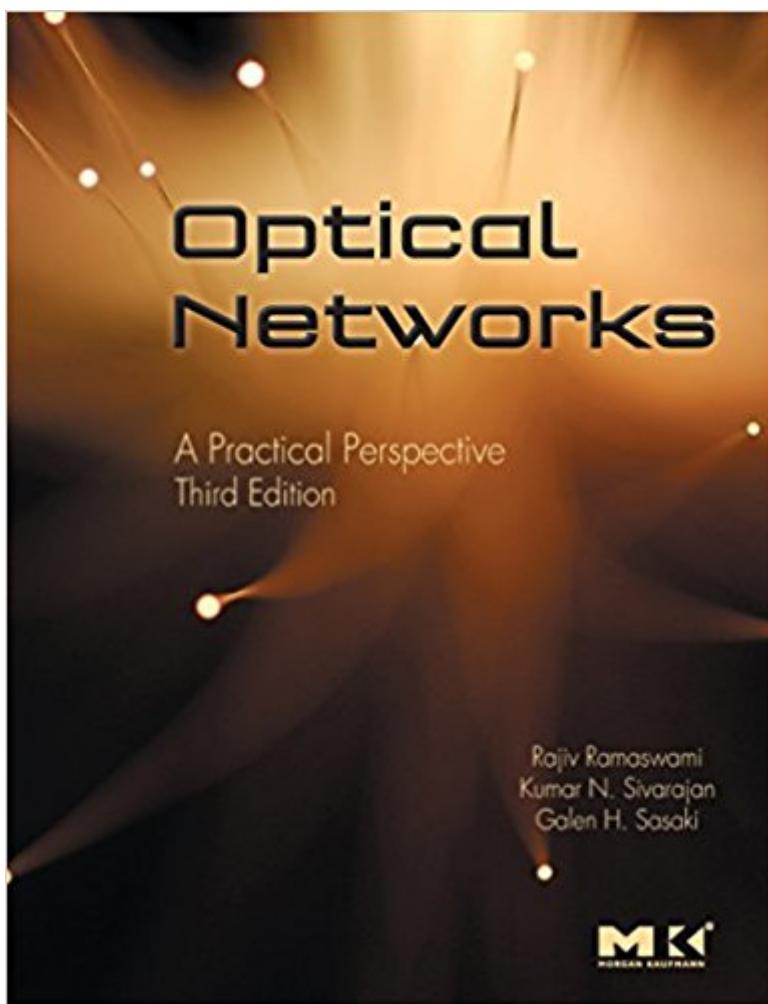


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# Optical Networks: A Practical Perspective, 3rd Edition



## Synopsis

The third edition of Optical Networks continues to be the authoritative source for information on optical networking technologies and techniques. Componentry and transmission are discussed in detail with emphasis on practical networking issues that affect organizations as they evaluate, deploy, or develop optical networks. New updates in this rapidly changing technology are introduced. These updates include sections on pluggable optical transceivers, ROADM (reconfigurable optical add/drop multiplexer), and electronic dispersion compensation. Current standards updates such as G.709 OTN, as well as, those for GPON, EPON, and BPON are featured. Expanded discussions on multimode fiber with additional sections on photonic crystal and plastic fibers, as well as expanded coverage of Ethernet and Multiprotocol Label Switching (MPLS). This book clearly explains all the hard-to-find information on architecture, control and management. It serves as your guide at every step of optical networking-- from planning to implementation through ongoing maintenance. This book is your key to thoroughly understanding practical optical networks. In-depth coverage of optimization, design, and management of the components and transmission of optical networks. Filled with examples, figures, and problem sets to aid in development of dependable, speedy networks. Focuses on practical, networking-specific issues: everything you need to know to implement currently available optical solutions.

## Book Information

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## Customer Reviews

Fiber-optic networking, on both small and large scales, has lots of advantages over traditional wire

and wireless networks. First, optical signals can travel enormous distances without the need for amplification. Second, optical networks provide enormous bandwidth that is hundreds of times larger than that of many other media. In Optical Networks, authors Ramaswami and Sivarajan explore the scientific concepts and engineering considerations behind light-based networks. The authors begin with the physical phenomena that make optical networks possible. They cover characteristics of light in depth, with an eye toward optimizing light's ability to carry signals long distances. They progress to detailing the hardware that makes networks possible, including multiplexers, filters, amplifiers, transmitters, detectors, and switches. Generally, discussion is theoretical, rather than oriented toward any particular make and model of gear. The authors then cover various means of encoding information into light waves, paying attention to topics such as wavelength routing, network topology, and management. Readers who are planning to put together an optical network may find that the book's case studies are the most interesting part of the text. The authors give examples of real-world networks that different companies have built, such as AT&T's Africa ONE and Alcatel's WDM Ring. They then analyze each system, picking out the strong and weak points of each. This is an academic book, full of equations, graphs, and schematics. Don't expect to get a lot out of this book if you're wiring up your office's local area network (LAN). Optical Networks is appropriate if you work on big, high-capacity networks or if you want a glimpse of one possible future Internet infrastructure. --David Wall --This text refers to the Digital edition.

"The authors' grasp of what is truly workable and worthwhile in optical networks is fundamental, and they have effectively packaged this knowledge in an easy-to-comprehend text that will be valued to both veterans and those new to optical networking."-- Scott Grout, President and CEO, Chorum Technologies

The other reviews for this book that I have seen all address the previous edition. I used the newer 2nd edition of this text earlier this year for a 600 level graduate course on optical networks at the University of Arizona. Although the course also included current topics from other sources, there was a high degree of overlap with the text by Ramaswami and Sivarajan. This in and of itself demonstrates the current value of the text. Chapter 1 covers the basics. Chapter 2 is a brief description of the transmission of optical signals in fiber. Again, this is only background material for what follows. There have been entire textbooks written on the propagation of light in optical fibers. Chapter 3 on Components is where we first get into the heart of the text. Isolators, circulators, multiplexers, optical filters, amplifiers, transmitters (lasers), detectors, switches, and wavelength

converters are all covered in sufficient detail to lay the foundations for their use in optical networks. Chapter 4 provides a brief coverage of modulation and demodulation techniques. Chapter 5 is a high quality writeup on Transmission Systems Engineering, covering amplification, crosstalk, dispersion, and nonlinearities, and how they affect optical network design. The second part of the text, from Chapter 6 onwards, covers Optical Networking. Chapter 7 on WDM Network Elements covers Optical Line Terminals, Optical Line Amplifiers, Optical Add/Drop Multiplexers (OADMs), and Optical Cross Connects. The treatment of differing architectures of OADMs is particularly detailed, current, and relevant. Chapter 8 covers some advanced topics with unique aspects in optical networks, such as routing and wavelength assignment, lightpath topology design, wavelength conversion, and blocking probabilities in optical networks. As was Chapter 7, this information is also up-to-date, current, and relevant to the design of modern optical networks. This book has a total of 13 chapters. You can peruse the table of contents in the book description to get an understanding of some of the other optical networking topics covered. However, the chapters I have reviewed were essentially those topics that overlapped with the graduate optical networking class that I took at U of A. All in all, I highly recommend this text for anyone wishing to gain an understanding of optical networks. This book provides the foundation for advanced courses such as the one I took, but is also sufficiently readable to serve as an introduction to the topic of optical networks for someone with little prior background in the area. In other words, the text is not mathematically demanding.

It is for sure a good book, clearly written and rationally organized. Its only defect is that the optical networking field is a rapidly evolving one and even if subsequent editions have updated the book, a few recent key technologies are not considered. For example electronic linearization of fiber transmission or optical TDM are not dealt with.

Great book

Das Buch war in gutem Zustand, so wie in der Werbung geschrieben war. Ich bin zufrieden.

This is surely the best book on fiber optics networks. It's that rarity - an accessible academic book which doesn't ignore the practical side of things either. Therefore it is useful both as a textbook as well as a refresher for professionals. We studied the draft of this book in a course in the Indian Institute of Science in 1997 conducted by Professor K.N. Sivarajan, one of authors and a world-wide authority on the subject. It was an enjoyable course, and we felt that we were truly studying the latest

technology - in fact, even some of the future technology, since the book included architectures that hadn't been built yet(ie conceptual architectures)!Later on, as a professional systems engineer i worked in a team writing firmware for a SONET based product, and this book was much admired by my colleagues as well. This book has all the basic scientific and engineering concepts and considerations involved in understanding and designing fiber optic networks. The treatment is mathematical and the writing is lucid. Towards the later part, there are detailed case studies that will be truly helpful for the professionals designing their own networks. Since it was written almost 4 years ago, it cannot have all the latest information in this rapidly expanding field - but for a sound, balanced introduction to the fundamentals, this is your book.

I got this book while working on my masters in electro-optics, and found that it completed the big picture of optical communications and how network components fit together which was lacking in my detailed graduate work. I especially recommend it to those with a background other than EE, as it fills in a lot of gaps that EE folks assume that others know. It starts off pretty light and qualitative, then begins incorporating some equations and formulas to accompany the qualitative descriptions. It does not waste time deriving anything, nor will you find pages of just mathematical equations. It has references and problems at the end of each chapter for the more technical reader. For non-technical readers, this book is not light reading, but if you are patient enough to breeze over certain sections of math, you will find plenty of useful qualitative descriptions that do not depend on a full understanding of the math. There are even large sections of the book with no math at all. In short, this book offers an excellent bridge between quantitative and qualitative descriptions of optical communications and optical networks.

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