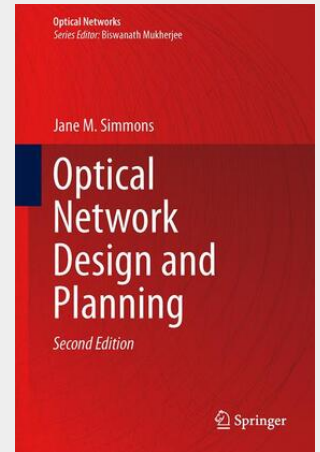


Optical Network Design and Planning

This book takes a pragmatic approach to deploying state-of-the-art optical networking equipment in metro-core and backbone networks. The book is oriented towards practical implementation of optical network design. Algorithms and methodologies related to routing, regeneration, wavelength assignment, sub rate-traffic grooming and protection are presented, with an emphasis on optical-bypass-enabled (or all-optical) networks. The author has emphasized the economics of optical networking, with a full chapter of economic studies that offer guidelines as to when and how optical-bypass technology should be deployed. This new edition contains: new chapter on dynamic optical networking and a new chapter on flexible/elastic optical networks. Expanded coverage of new physical-layer technology (e.g., coherent detection) and its impact on network design and enhanced coverage of ROADM architectures and properties, including colorless, directionless, contentionless and gridless. Covers 'hot' topics, such as Software Defined Networking and energy efficiency, algorithmic advancements and techniques, especially in the area of impairment-aware routing and wavelength assignment. Provides more illustrative examples of concepts are provided, using three reference networks (the topology files for the networks are provided on a web site, for further studies by the reader). Also exercises have been added at the end of the chapters to enhance the book's utility as a course textbook.

This book takes a pragmatic approach to designing state-of-the-art optical networks for backbone, regional, and metro-core networks. Algorithms and methodologies related to routing, regeneration, wavelength assignment, subrate-traffic grooming, and protection are presented, with an emphasis on optical-bypass-enabled (or all-optical) networks. There are numerous case studies throughout the text to illustrate the concepts, using realistic networks and traffic sets. A full chapter of economic studies offers guidelines as to when and how optical-bypass technology should be deployed. There is also extensive coverage of recent research to provide insight into how optical networks are likely to evolve. The second edition includes new chapters on dynamic optical networking and flexible/elastic optical networks. There is expanded coverage of new physical-layer technology and its impact on network design, along with enhanced coverage of ROADM architectures, including the colorless, directionless, contentionless, and gridless properties. It covers other hot topics such as software defined networking, energy efficiency, and multi-domain networks, as well as new architectural paradigms and algorithmic techniques. Numerous exercises have been added to probe the concepts in more detail and inspire directions for future research.



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