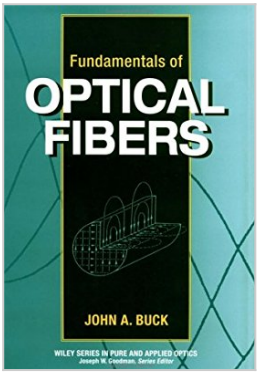

Fundamentals of Optical Fibers (Wiley Series in Pure and Applied Optics)

By John A. Buck

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Fundamentals of Optical Fibers offers students a timely, pedagogically consistent introduction to the fundamental principles of light propagation in fibers. In it, Professor John A. Buck reviews, in depth, fundamental waveguiding concepts, the influence of various fiber structures and materials on light transmission, nonlinear light propagation effects occurring in fibers, and various measurement techniques. Since the chief application of optical fibers is in communication systems, throughout the book the focus is on topics which pertain to that domain.

In the first part of the text, the author lays the groundwork for later discussions with a detailed review of the relevant electromagnetic principles and how they apply to the analysis of wave propagation. He also introduces basic field equations and delineates the fundamental principles of dielectric waveguides.

In the second part, he explores the limitations of fiber transmission, paying particular attention to the problems of loss and dispersion. He reviews fabrication procedures and alternative fiber designs as they relate to minimizing loss and dispersion. And he presents field analysis methods for single mode and multimode fibers having graded index profiles.

In the last part, Professor Buck reviews the basics of nonlinear optics and discusses the origins of nonlinear effects and the conditions under which they appear in fibers. This section also features a discussion of fiber amplifiers, along with a review of the fundamentals of light amplification by stimulated emission.

Offering a well-balanced presentation of the basics of light propagation in fibers, and including real-world examples and end-of-chapter problems, Fundamentals of Optical Fibers is an excellent text for senior- to graduate-level courses in electrical engineering or physics. It is accessible to anyone who has taken at least a one-semester course in electromagnetics at the undergraduate level.

Offering a balanced presentation of the basics of light propagation in fibers, Fundamentals of Optical Fibers is an excellent introductory text for senior- to graduate-level courses in electrical engineering or physics. It was designed to be accessible to virtually anyone who has taken undergraduate courses in

electromagnetics, and because it treats a number of key issues in fiber communications systems, it serves equally well as a supplement to fiber systems books used in most communications-oriented courses.

Covers light propagation in optical fibers with an emphasis on issues pertaining to communications systems.

- Reviews, in depth, relevant waveguiding concepts and the influence of fiber structures and materials on light transmission
- Explores the limitations of fiber transmission techniques, with an emphasis on the problems of loss and dispersion and the fiber designs currently used to minimize them
- Describes field analysis methods for single mode and multimode fibers
- Explores the origins of nonlinear effects and the conditions under which they appear in fibers
- Includes real-world examples, and chapter-end problems

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- 264 pages

Editorial Review

From the Publisher
The purpose of this book is to provide the reader with a balanced account of the basics of light propagation in fibers. Includes the current level of technology in optical fiber design, along with measurement techniques and nonlinear effects. Provides a thorough treatment of the basic topics in optical fiber transmission and includes scores of examples and end-of-chapter problems.

From the Inside Flap
Fundamentals of Optical Fibersoffers students a timely, pedagogically consistent introduction to the fundamental principles of light propagation in fibers. In it, Professor John A. Buck reviews, in depth, fundamental waveguiding concepts, the influence of various fiber structures and materials on light transmission, nonlinear light propagation effects occurring in fibers, and various measurement techniques. Since the chief application of optical fibers is in communication systems, throughout the book the focus is on topics which pertain to that domain. In the first part of the text, the author lays the groundwork for later discussions with a detailed review of the relevant electromagnetic principles and how they apply to the analysis of wave propagation. He also introduces basic field equations and delineates the fundamental principles of dielectric wave-guides. In the second part, he explores the limitations of fiber transmission, paying particular attention to the problems of loss and dispersion. He reviews fabrication procedures and alternative fiber designs as they relate to minimizing loss and dispersion. And he presents field analysis methods for single mode and multimode fibers having graded index profiles. In the last part, Professor Buck reviews the basics of nonlinear optics and discusses the origins of nonlinear effects and the conditions under which they appear in fibers. This section also features a discussion of fiber amplifiers, along with a review of the fundamentals of light amplification by stimulated emission. Offering a well-balanced presentation of the basics of light propagation in fibers, and including real-world examples and end-of-chapter problems, Fundamentals of Optical Fibers is an excellent text for senior- to graduate-level courses in electrical engineering or physics. It is accessible to anyone who has taken at least a one-semester course in electromagnetics at the undergraduate level.

From the Back Cover
An introduction to the operating principles of optical fiber

Substantially rewritten, Fundamentals of Optical Fibers, Second Edition offers readers a timely and consistent introduction to the fundamental principles of light propagation in fibers. Incorporating the many developments in the field since the first edition appeared in 1995, this new edition reviews, in-depth, fundamental waveguiding principles, the influence of various fiber structures and materials on light transmission, and nonlinear propagation effects. Since the main applications of optical fibers occur within communication systems, the focus throughout is on topics that pertain to that domain.

Equally useful to professionals seeking an in-depth reference and as a text for senior- and graduate-level students, the book:

- Explains relevant waveguiding concepts and the influences of fiber structures and materials on light transmission
- Explores the limitations of fiber transmission, emphasizing the problems of loss and dispersion and the fiber designs currently used to control them

- Describes and demonstrates field analysis methods applicable to single-mode and multimode fibers
- Explores the origins of fiber nonlinearities, the principal nonlinear effects in fiber transmission, and applications
- Features new or enhanced discussions of such topics as polarization dispersion, polarization-maintaining fiber, photonic crystal fiber, rare-earth-doped fiber amplifiers, Raman amplifiers, soliton propagation, and more

Examples and chapter-end problems enhance the material, making this a well-balanced presentation of the basics of light propagation in fibers that is sure to become a standard in the field.

Users Review

From reader reviews:

Christine Frazier:

In this 21st hundred years, people become competitive in every way. By being competitive currently, people have do something to make these individuals survives, being in the middle of the particular crowded place and notice by surrounding. One thing that often many people have underestimated that for a while is reading. Sure, by reading a reserve your ability to survive increase then having chance to stay than other is high. For yourself who want to start reading any book, we give you that Fundamentals of Optical Fibers (Wiley Series in Pure and Applied Optics) book as basic and daily reading guide. Why, because this book is greater than just a book.

Robert Zamora:

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Karen Lheureux:

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