



**Fundamentals of Fibre Optics in Telecommunication and Sensor Systems.**

Bishnu P. Pal. New Age International (P) Ltd, 7/30A, Daryaganj, New Delhi 110 002, 2015. xxiv + 620 pages. Price: Rs 399.

The book under review is very well organized and comprehensive, covering from the basic to the advanced topics in the field of fibre optics and photonics. The impressive part of the book is the semi-tutorial approach by the contributors in the presentation of the fundamentals of this emerging technology as applied to telecommunication and sensor development. The book was conceived after the simultaneous publication in 1986 of the two journals: *JIETE* and *IETE Technical Review*, published by the Institution of Electronics and Telecommunication Engineers (India) in which B. P. Pal served as a Guest Editor.

In my view, the book consists of three parts. Part I deals with the fundamentals of optical waveguides, part II features optical sources, detectors and communication system designs and part III is devoted to application of fibre optic devices and sensors. Part I (comprising chapters 1–12) discusses ideas of various aspects of optical waveguides. Chapters 1 and 2 deal with historical evolution and current status of fibre optics and related technologies. Chapters 3–6 describe electromagnetics of fibre and integrated opti-

cal waveguides and the physics behind their propagation characteristics. Nonlinear processes in optical waveguides are discussed in chapters 7 and 8. Chapters 9–12 focus on the fabrication and characterization of optical fibres and cables.

The second part (comprising chapters 13–21) features various aspects of optical sources, detectors and communication systems designs. The introductory remarks about optical sources and detectors are given in chapter 13 by the Editor himself. The semiconductor laser sources and detectors/receivers for optical communication are discussed in chapters 14 through 17. Chapter 18 is devoted to fundamentals of digital communication, which is the most well suited modulation scheme for optical communication. Chapters 19 and 20 are concerned with optical fibre system designs for direct detection and coherent optical fibre transmissions respectively. Different types of guided wave optical devices are discussed in chapter 21 on integrated optical devices.

The third part (consisting of chapters 22–29) present a brief description of the various industrial applications of fibre optical devices and sensors. Chapter 22 makes introductory remarks on optical fibre sensors and devices along with several fundamental topics in this area. Chapters 23 and 24 describe principles behind intensity and phase modulated fibre sensors. Fused fibre couplers and several other in-line fibre components form the subject matter of chapters 25 and 26. Chapters 27 and 28 are concerned with signal processing in single-mode optical fibre sensors and multiplexed operation of fibre sensors respectively. The final chapter of the book deals with application of optical fibres in power industries.

Overall, the book is well compiled and covers from the basic to the advanced topics in the fibre optics communications and sensors. This book could well serve as a reference source for students at UG and PG level courses in Engineering and

Applied Physics. To give a glimpse of the topic to be discussed, each section has an introductory remark, which will help even the novice to follow the matter. Readers having elementary knowledge of electromagnetic theory, lasers, semiconductor physics and electronics at the UG/PG level will find the book useful. There are many advanced topics covered in the book, with proper references to the original publications. This can be useful to researchers and R&D engineers who are all looking for a tutorial introduction to the technologies of fibre optical communication and sensors.

I am particularly impressed that the matter for the book has been collected from top scientists, who are all pioneers in their respective fields. So there is never a question about the quality of the matter presented in the book. All the topics and chapters are presented with large collection of figures, illustrations and tables, which will be useful for better understanding the concepts. Although I have positive opinion about the book, I would like to emphasize that book is not updated in-line with current rapid advancements in the field of fibre optics, which is reflected in the references, as most of them are before the year 2000. As we all know, the kind of development the fibre optics has witnessed during the last decade is phenomenal and cannot be ignored. I am not sure, whether it is possible to include those in a more complete book; another volume would be a nice option too. I would recommend to the author to extend his effort to bring out another volume with updated results in the fibre optics and communication. Nevertheless, the book is comprehensive and benefit the younger generation of optical engineers and scientists.

K. PORSEZIAN

*Department of Physics,  
Pondicherry University,  
Puducherry 605 014, India  
e-mail: ponzsol@yahoo.com*