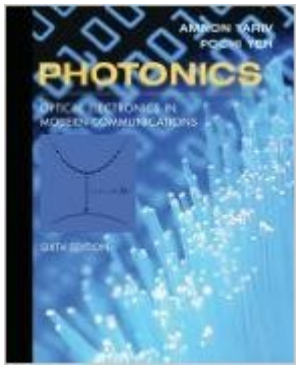
Photonics: Optical Electronics In Modern Communications (The Oxford Series In Electrical And Computer Engineering)



Synopsis

Due to its central role in modern communications technologies, photonics--or optical electronics--has evolved dynamically over the last ten years. Photonics by Amnon Yariv and Pochi Yeh is extensively revised and updated to keep pace with this unprecedented development. Now more tailored to optical communication, the sixth edition integrates material on generating and manipulating optical radiation and designing photonic components for the transmission of information. It also presents a broader theoretical underpinning and more explanations of mathematical derivations than the previous edition.The text describes the basic physics and principles of operation of major photonic components in optical communications and electronics. These components include optical resonators, various lasers, waveguides, optical fibers, gratings, and photonic crystals. photonics, Sixth Edition, also covers the transmission, modulation, amplification, and detection of optical beams in optical networks, as well as nonlinear optical effects in fibers. It assumes a background in electromagnetic theory, Maxwell's equations, and electromagnetic wave propagation.Including numerous examples throughout, Photonics, Sixth Edition, is ideal for advanced undergraduate and graduate courses in photonics, optoelectronics, or optical communications. It is also a useful reference for practicing engineers and scientists.New Material in the Sixth EditionÂ Stokes Parameters and PoincarÃ© Sphere: polarization states in birefringent optical networks, principal states of polarizationÂ Fermat's Principle: rays, beam propagation, and the Fresnel diffraction integralÂ Matrix Formulation: wave propagation in multi-cavity etalons, multi-layer structures, mode coupling, and supermodes in mode-locked lasersÂ Dispersion: chromatic dispersion and polarization mode dispersion (PMD) in fibers and their compensationÂ Coupled Resonators Optical Waveguides (CROWs): matrix formulation, critical coupling and dispersion relationÂ Nonlinear Optical Effects in Fibers: self-phase modulation, cross-phase modulation, stimulated Brillouin scattering (SBS), stimulated Raman scattering (SRS), optical four-wave mixing, and spectral reversal (phase conjugation)Â Electroabsorption: waveguide electro-optic Mach-Zehnder modulatorsÂ Photonic Crystals: Bloch wave formulation, photonic bands, photonic bandgaps, periodic layered media, fiber Bragg gratings, and Bragg reflection waveguidesÂ Optical Amplifiers: SOA, EDFA, and Raman

Book Information

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Customer Reviews

An excellent book on the optics side, with good theoretical derivations on many topics. However, I wish that the sections on semiconductor devices were more extensively updated in one of these new editions, especially since Yariv's group at CalTech were pioneers in the field of semiconductor lasers, and it would be well worth knowing what insights he can give on modern devices. For example, there is no discussion of strained quantum wells that I could find. The book has an excellent discussion of Bragg mirrors, and some discussion of their use in DFB lasers and VCSELs, but nothing about resonant cavity LEDs or resonant cavity photodiodes (or even just plain vanilla LEDs). The description of APDs is one of the few covered areas that is not rigorous. Of course, the book is a reasonable size, and so cannot contain everything, but I get the feeling that the semiconductor device areas were hardly touched from earlier editions. However, most of what Yariv and Yeh do cover, they do so in a detailed manner, so this is still a good book to have around. Chapters:1. Electromagnetic Fields and Waves2. Rays and Optical Beams3. Guided waves in Dielectric Slabs and Fibers4. Optical Resonators5. Interaction of Radiation and Atomic Systems6. Theory of Laser Oscillation and Some Specific Laser Systems7. Chromatic Dispersion and Polarization Mode Dispersion in Fibers8. Nonlinear Optics9. Electro-Optic Modulation of Laser Beams10. Noise in Optical Detection and Generation11. Detection of Optical Radiation12. wave propagation in Periodic Media13. Waveguide Coupling14. Nonlinear Optical Effects in Fibers15. Semiconductor Lasers-Theory and Applications16. Advanced Semiconductor Lasers17. Optical Amplifiers18.

Photonics: Optical Electronics in Modern Communications (The Oxford Series in Electrical and

Computer Engineering) Photonics Rules of Thumb: Optics, Electro-Optics, Fiber Optics, and Lasers (Optical and Electro-Optical Engineerirng Series) Optical Processes in Semiconductors (Prentice-Hall electrical engineering series. Solid state physical electronics series) Elements of Power Electronics (The Oxford Series in Electrical and Computer Engineering) Fundamentals of Microwave Photonics (Wiley Series in Microwave and Optical Engineering) Computer Architecture: From Microprocessors to Supercomputers (The Oxford Series in Electrical and Computer Engineering) The Science and Engineering of Microelectronic Fabrication (The Oxford Series in Electrical and Computer Engineering) Fabrication Engineering at the Micro- and Nanoscale (The Oxford Series in Electrical and Computer Engineering) Data and Computer Communications (10th Edition) (William Stallings Books on Computer and Data Communications) Data and Computer Communications (William Stallings Books on Computer and Data Communications) Modern Digital and Analog Communication Systems (The Oxford Series in Electrical and Computer Engineering) Fundamentals of Network Analysis and Synthesis (Prentice-Hall electrical engineering series. Solid state physical electronics series. Prentice-Hall networks series) Optical Fiber Telecommunications Volume VIB, Sixth Edition: Systems and Networks (Optics and Photonics) Optical Fiber Telecommunications Volume VIA, Sixth Edition: Components and Subsystems (Optics and Photonics) Linear System Theory and Design (The Oxford Series in Electrical and Computer Engineering) An Introduction to Mixed-Signal IC Test and Measurement (Oxford Series in Electrical and Computer Engineering (Hardco) Electric Machinery and Transformers (The Oxford Series in Electrical and Computer Engineering) Operation and Modeling of the MOS Transistor (The Oxford Series in Electrical and Computer Engineering) Operation and Modeling of the MOS Transistor: Special MOOC Edition (The Oxford Series in Electrical and Computer Engineering) Digital Control Systems (The Oxford Series in Electrical and Computer Engineering)