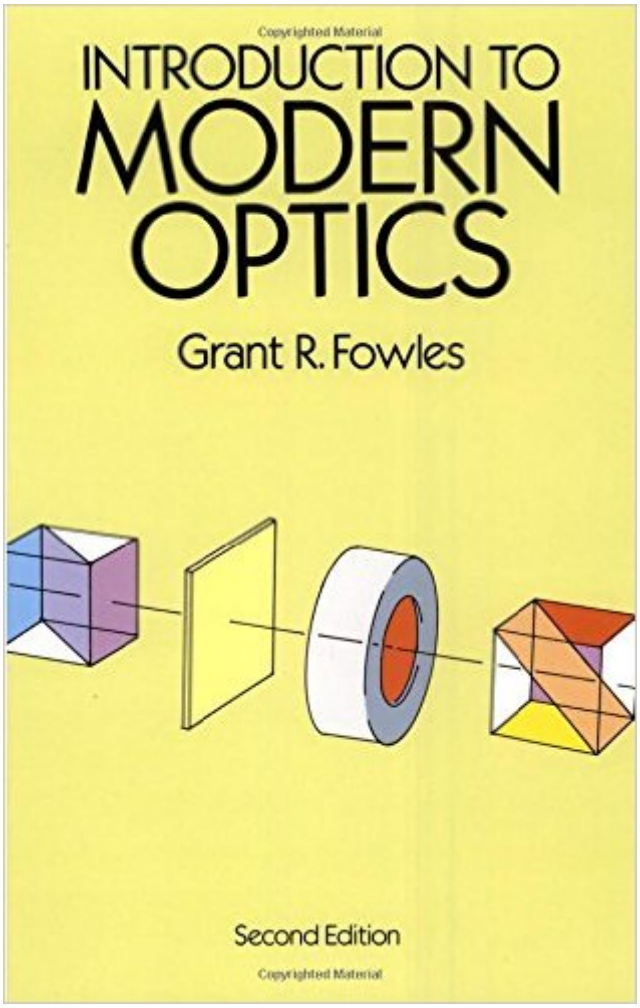
Introduction To Modern Optics (Dover Books On Physics)



Synopsis

This incisive text provides a basic undergraduate-level course in modern optics for students in physics, technology and engineering. The first half of the book deals with classical physical optics; the second principally with the quantum nature of light. Chapters 1 and 2 treat the propagation of light waves, including the concepts of phase and group velocities, and the vectorial nature of light. Chapter 3 applies the concepts of partial coherence and coherence length to the study of interference, and Chapter 4 takes up multiple-beam interference and includes Fabry-Perot interferometry and multilayer-film theory. Diffraction and holography are the subjects of Chapter 5, and the propagation of light in material media (including crystal and nonlinear optics) are central to Chapter 6. Chapters 7 and 8 introduce the quantum theory of light and elementary optical spectra, and Chapter 9 explores the theory of light amplification and lasers. Chapter 10 briefly outlines ray optics in order to introduce students to the matrix method for treating optical systems and to apply the ray matrix to the study of laser resonators.Many applications of the laser to the study of optics are integrated throughout the text. The author assumes students have had an intermediate course in electricity and magnetism and some advanced mathematics beyond calculus. For classroom use, a list of problems is included at the end of each chapter, with selected answers at the end of the book.

Book Information

Series: Dover Books on Physics

Paperback: 336 pages

Publisher: Dover Publications; 2 edition (June 1, 1989)

Language: English

ISBN-10: 0486659577

ISBN-13: 978-0486659572

Product Dimensions: 0.8 x 5.2 x 8.5 inches

Shipping Weight: 13.4 ounces (View shipping rates and policies)

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Customer Reviews

If you’re studying optics in a college class using Hecht’s classic text, or if you are an engineer who

needs an overview of the subject, this is a good practical and economical introduction to the subject. However, be aware that this book is short on two components - details of derivations of mathematical formulas and illustrations. That is not to say they do not exist, it is just to say that at several points during the book I could have been aided in my comprehension by either an illustration or derivation that simply wasn't there.There are end of chapter exercises included, and there are solutions to selected odd problems in the back of the book. However, there are no details as to how those solutions were arrived at. If you are an engineer, the only way to really be sure that you understand a subject is to solve problems. Thus I suggest Schaum's Outline of Optics by Hecht for that task. Often the solutions to problems in that outline are the mathematical details that are missing in this book!The table of contents are not included in the product description, so I add that here:Chapter 1 The Propagation of Light1.1 Elementary Optical Phenomena and the Nature of Light1.2 Electrical Consants and the Speed of Light1.3 Plane Harmonic Waves. Phase Velocity1.4 Alternative Ways of Representing Harmonic Waves1.5 Group Velocity1.6 The Doppler EffectChapter 2 The Vectorial Nature of Light2.1 General Remarks2.2 Energy Flow. The Poynting Vector2.3 Linear Polarization2.4 Circular and Elliptic Polarization2.5 Matrix Representation of Polarization. The Jones Calculus2.6 Reflection and Refraction at a Plane Boundary2.7 Amplitudes of Reflected and Refracted Waves. Fresnel's Equations2.

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